Pit and Quarry

With which is consolidated

CEMENT-MILL & QUARRY

October, 1934

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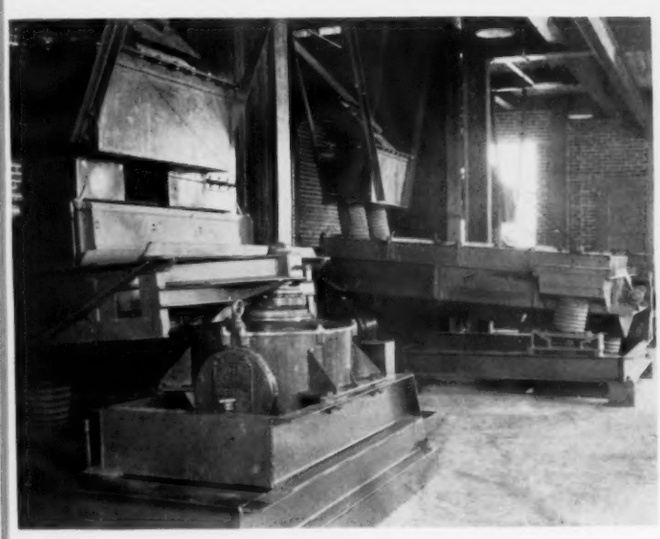
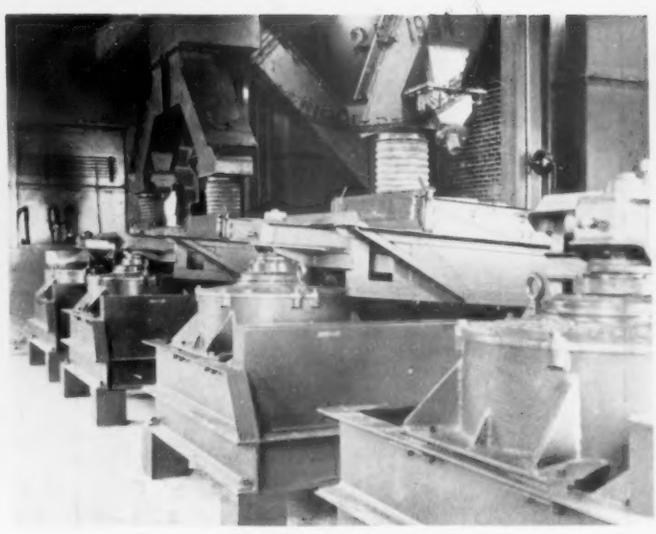


Rotex Scalping Screeners



Rotex Finishing Screeners

Minnesota Mining's New Quartzite Plant Uses Rotex Screeners Exclusively

Modern screening practice at its best—that describes the operation at the new plant of the Minnesota Mining & Manufacturing Company, where the separation of quartzite for roofing granules shows a typical application of ROTEX Screeners.

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They are fully enclosed and connected with dust collectors, insuring clean plant conditions. As the material passes the scalping screens, the oversize goes to the crushing rolls, returning by elevators to the screens. The fines discharge to the finishing screens, and the material remaining on the lower deck is the finished product averaging 35 mesh to 10 mesh granules.

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ROTEX

Pages 19-23

ROBINS

IS WELL REPRESENTED AT NORRIS DAM. THE T. V. A.'S FIRST CHOICE FOR HEAVY SCALPING SCREEN AND ALL CONVEYING

The conveyor at the upper right of this picture brings stone from primary crusher to a Gyrex Screen above the secondary crusher. The conveyor in the left foreground is the first of a series running to storage and concrete mixers.

ROBINS Double Deck GYREX screen similar to the primary scalper at Norris Dam.

In the concrete aggregate preparation plant for the construction of the Norris Dam, as described in the September issue of Pit and Quarry, the large stone from the primary crusher is brought by a ROBINS Belt Conveyor to the scalping screen — a ROBINS double-deck GYREX, 4′ x 8′-6″, with 6″ openings in the top deck and 3″ in the bottom deck—for the tough job of separating 300 tons per hour of this hard rock.

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Pit and Quarry

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Volume 27 October, 1934 Number 4

MEMBER AUDIT BUREAU OF CIRCULATIONS

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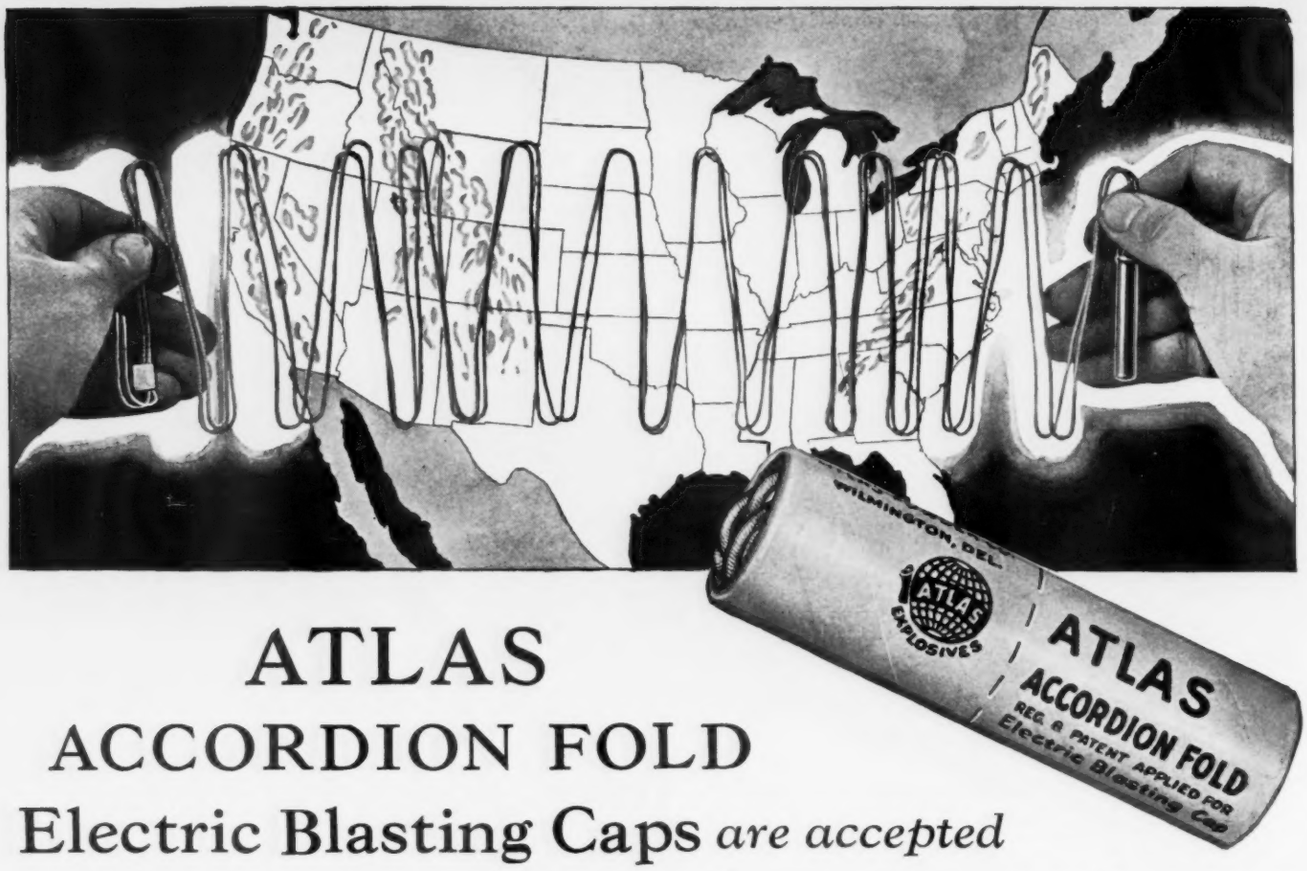

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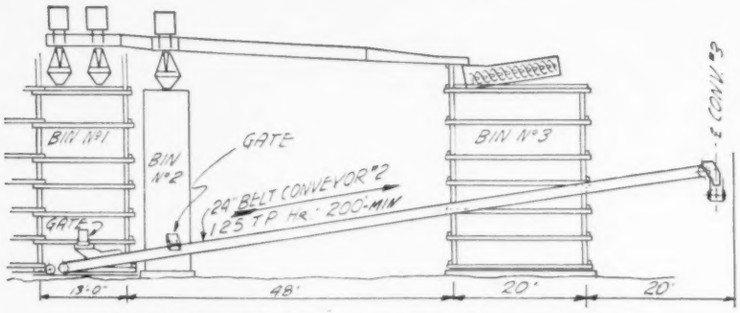
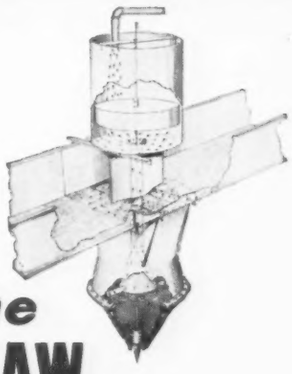


Modernized sand classification facilities for Northern Gravel Co., Muscatine, Iowa. Three Shaw classifiers, and screw conveyor unit.



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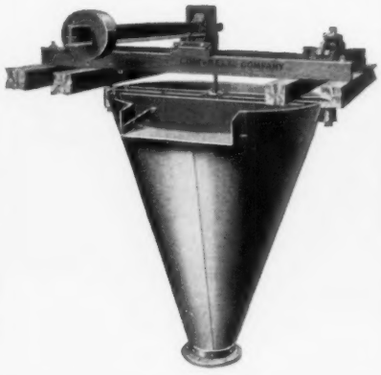

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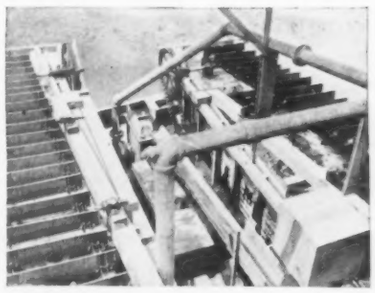
Typical Link-Belt double screw conveyor sand dewatering unit.



Two Link-Belt dewatering flight conveyors at Cooley Gravel Co. plant, near Chillicothe, Mo.

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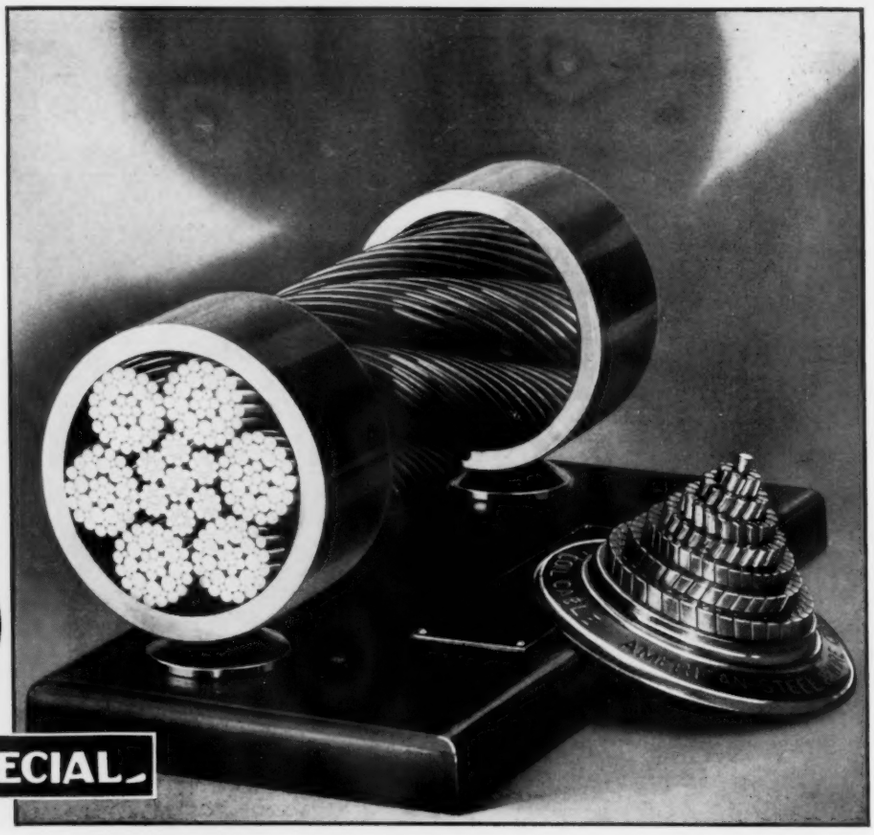

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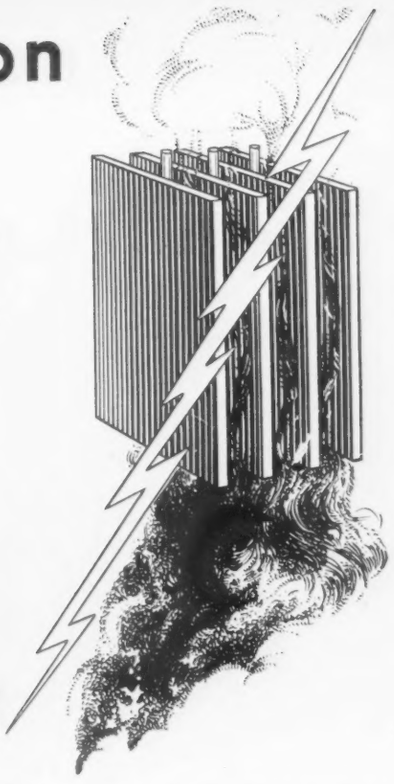
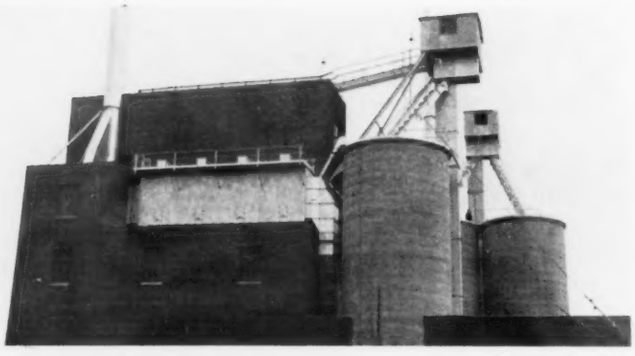
gives 99.5% dust recovery

at the new Minnesota Mining & Mfg. Plant





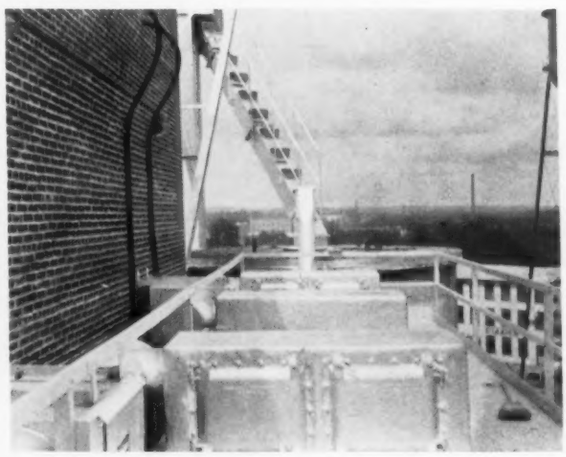
New plant of the Minnesota Mining & Manufacturing Company at Wausau, Wisconsin—equipped with Cottrell Electrical Precipitators.

MODERN in all that the term implies—that best describes the new plant of the Minnesota Mining & Manufacturing Company at Wausau, Wisconsin.

Here you will find the latest engineering developments in construction, equipment, material handling and dust disposal. Every detail of design and method of processing claim the attention of plant men who are seeking better and cheaper production.

One of the features of the installation is the system of Electrical Precipitation, specially worked out for this job by Research Corporation engineers. It sets a new standard for efficiency in dust collection, insuring clean plant conditions, protecting health of employees, preventing "dust abrasion" on motors, gears, and bearings, and eliminating dust nuisance in the community.

Showing upper sections of the two-unit Cottrell Electrical Precipitator which recovers all dust from the crushing, grinding and screening equipment.



The main system collects dust from each unit of equipment and from every room where dust is created, passing it through a settling chamber to remove the coarser particles, and then discharging the air and fine dust to a two-pass Cottrell Precipitator. This recovers between 99.4% and 99.7% at a power consumption of only 12 to 13 kw. A single unit Cottrell Precipitator handles the hot, moist gases from the dryer, recovering better than 99% and using only 5 kw.

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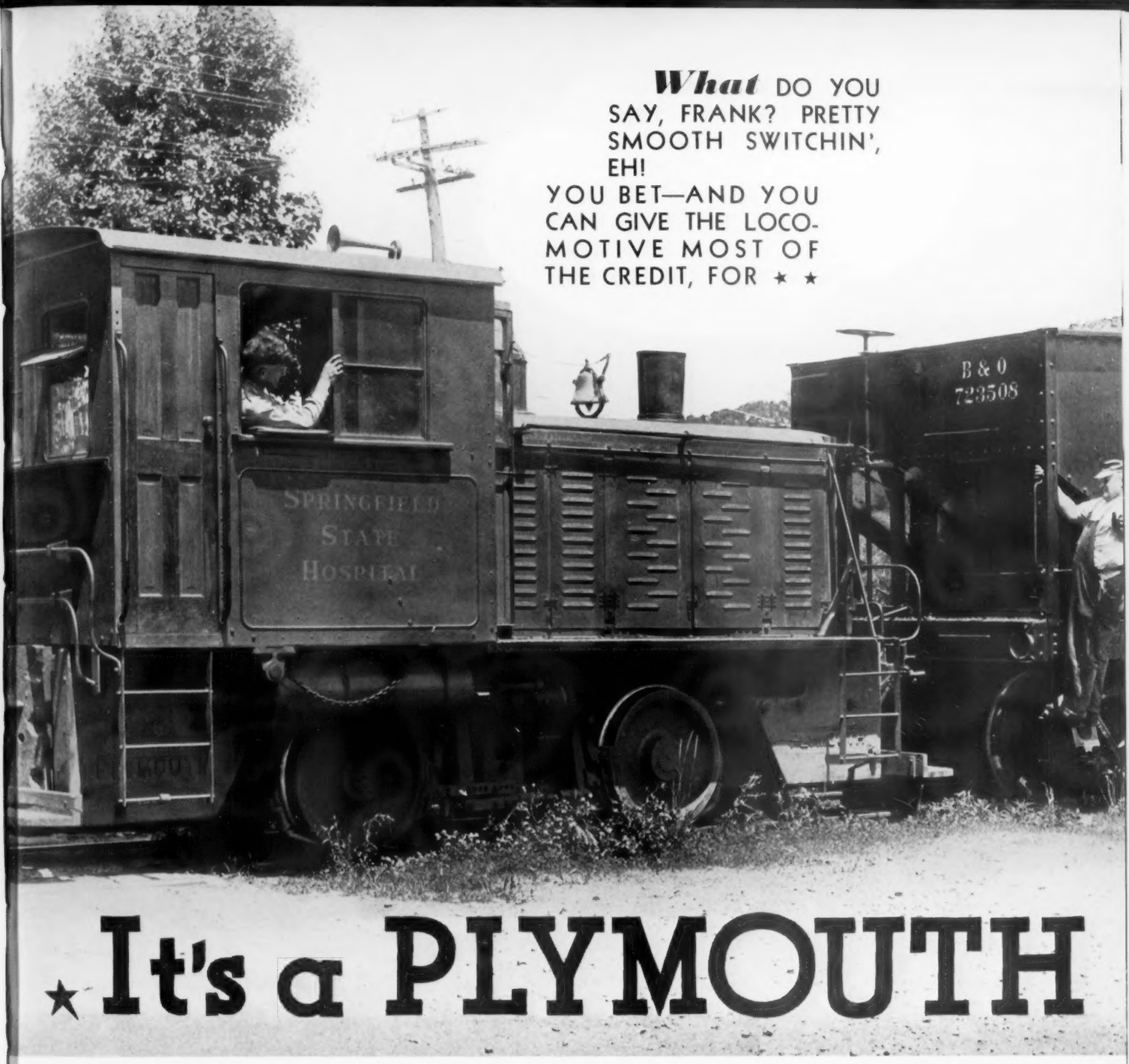

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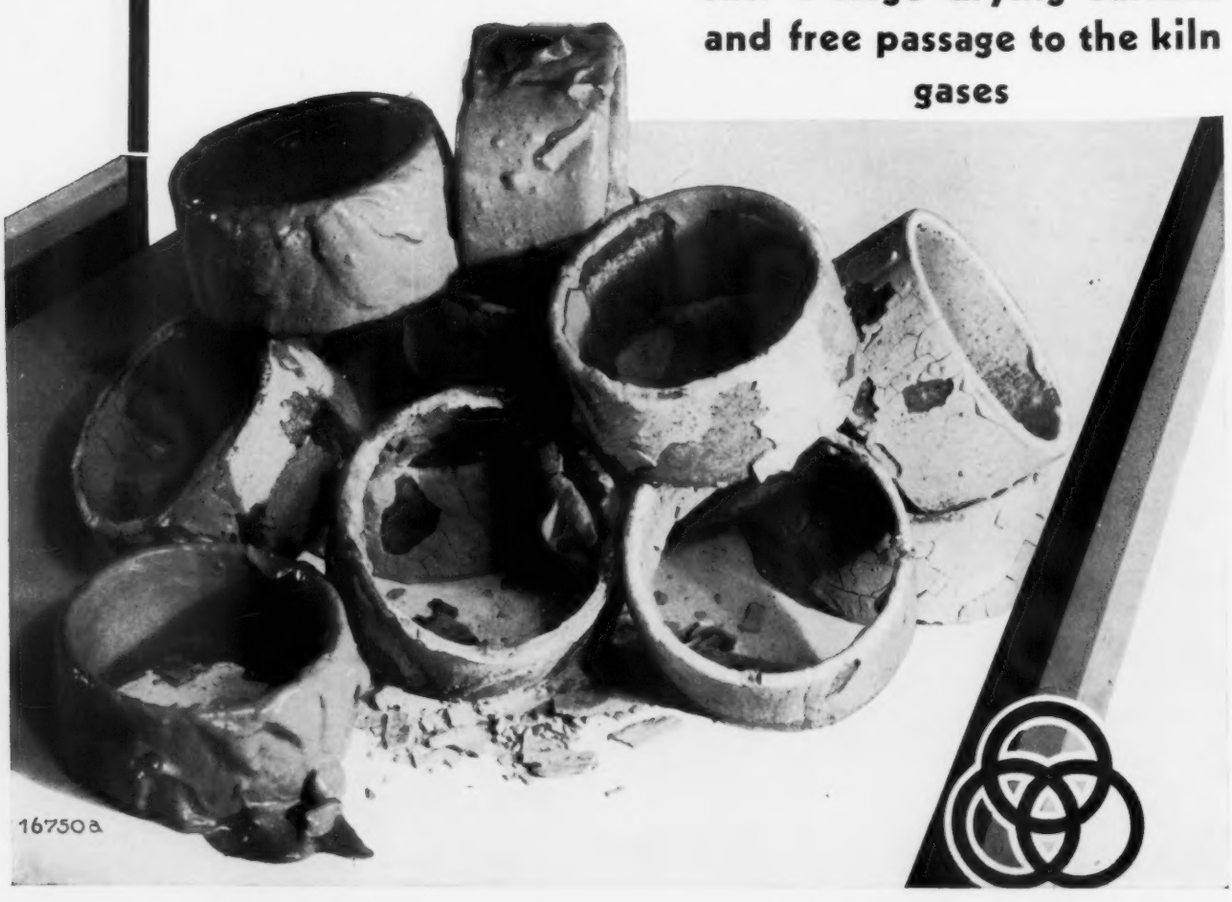

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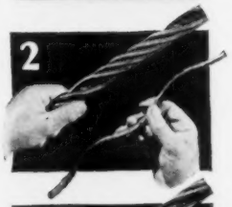

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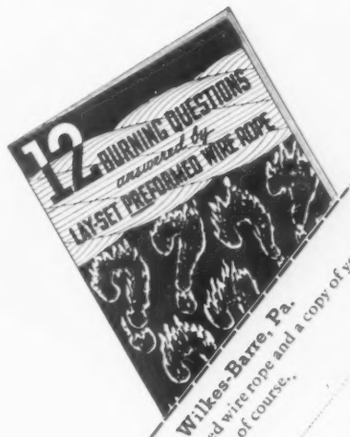

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Diesel Engines. By Lacey H. Morrison. 598 pages 6x9; 385 illustrations. The book describes the various forms of Diesel engines now available, explains their construction and operation, tells how to keep them running in good condition and how to install them. Actual operation costs of Diesel engines now in use in various industries are included.

Oil Engines. By Lacey H. Morrison. 475 pages 6x9; 357 illustrations. The construction and operation of oil engines. It describes the various types of Diesel, semi-Diesel and low-compression oil engines and shows how to install an oil engine.

Excavation Machinery, Methods and Costs. By A. B. McDaniel, Principal Engineer, Construction Division of the Army. 530 pages 6x9; illustrated. Contents: Tools for loosening and hand excavation; drag and wheel scrapers; blade or road graders; elevating graders; capstan plows; power shovels; scraper, templet, trench, and wheel excavators; cableways; dipper, ladder and hydraulic dredges; subaqueous rock drills; car and wagon loaders; highway and railroad construction; reclamation work; rivers, harbors and canals; municipal improvements; quarries, open-cut mines, gravel pits and brick yards; tunnels and underground mines.

Diatomaceous Earth. By Robert Calvert. A description of the present day industry of diatomaceous earth, its occurrence, mining and preparation, physical properties, and the rapid expansion of its use and application to new industries. Illustrated. 256 pages.

The Properties of Silica. By Robert B. Sosman. A monograph on silica in its various phases and transformations, discussing its structure and symmetry, its thermal and mechanical energy, its electric and magnetic properties, and its uses and applications in industry. 856 pages.

Bearing Metals and Bearings. By W. M. Corse. A survey of the fundamental principles and practices involved in the selection of bearings and bearing metals, together with a bibliography of reference literature from 1900-1928 inclusive. Illustrated. 383 pages.

Industrial Filtration. By Arthur Wright. It puts on record the author's twelve years of filter experience, and every effort has been made to make the information of practical value. Illustrated. 336 pages.

CONTENTS: Clarification; Cake building; Cake washing; Cake drying; Cake discharging; Filter media; Theory of filter application; Auxiliary equipment; Theory and mechanics as related to practice; Bag filters; Plate and frame presses; Suction leaf filters; Pressure leaf filters; The Kelly filter; the Sweetland filter, the Vallez filter; Rotary vacuum filters; Oliver filter, American continuous filter; FEinc apparatus; Special filters and clarifiers. Door apparatus, Merrill filter, Atkins-Shriver press, Burt filter, Zenith rotary hopper dewaterer, Oliver rotary sand table, FEinc acid sand filter; Application of different types of filters; Relation of filtration to other plant operations, drying, evaporation, etc., combination filtering and drying; Plant practice; Index.

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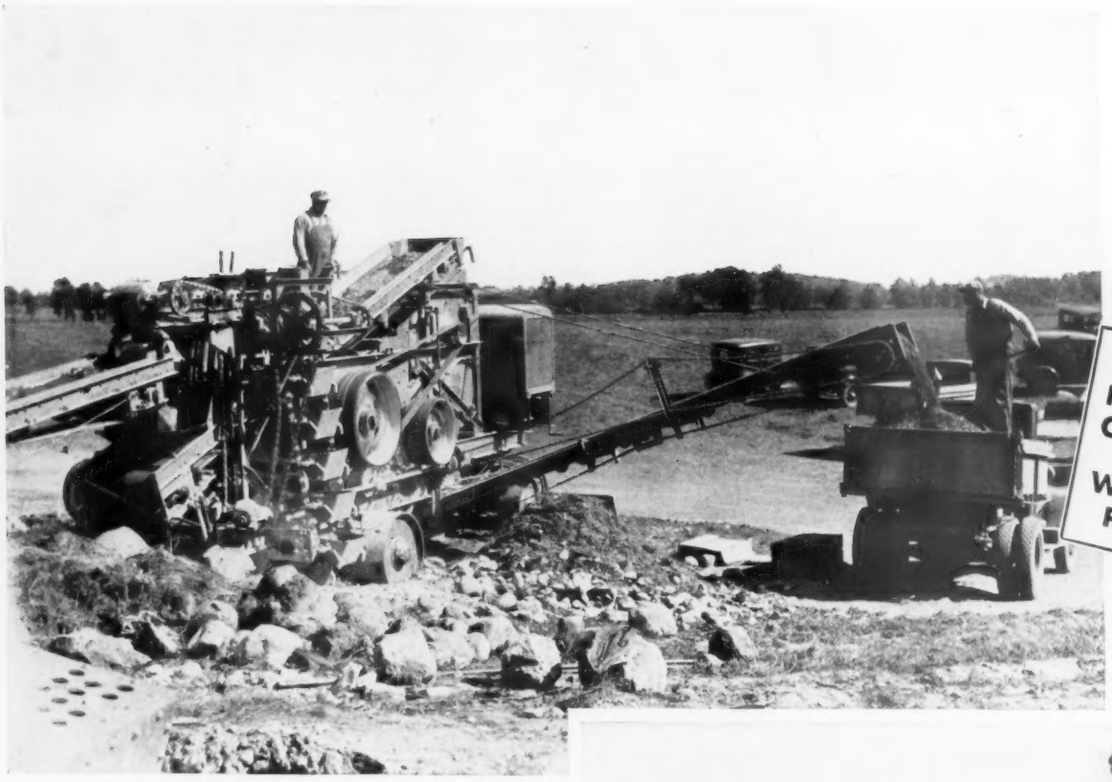

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Which do you need in your plant?

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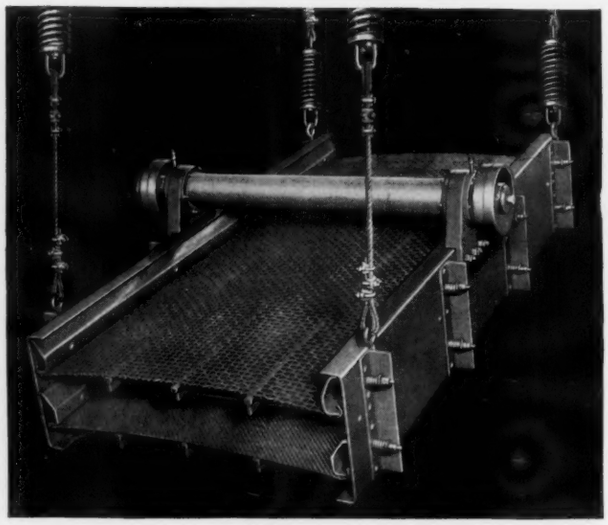
The "Aero-Vibe" screen "floats in the air" suspended from the supporting structure by cables and springs. A rapid, adjustable, vibrating motion is produced by counter-weighted wheels mounted on the drive shaft supported in anti-friction bearings above the screen body or vibrating member. Single and double deck "Aero-Vibe" screens are available from 1½ x 3 ft. to 4 x 10 ft. sizes for handling medium to fine size materials, and for limited tonnage.



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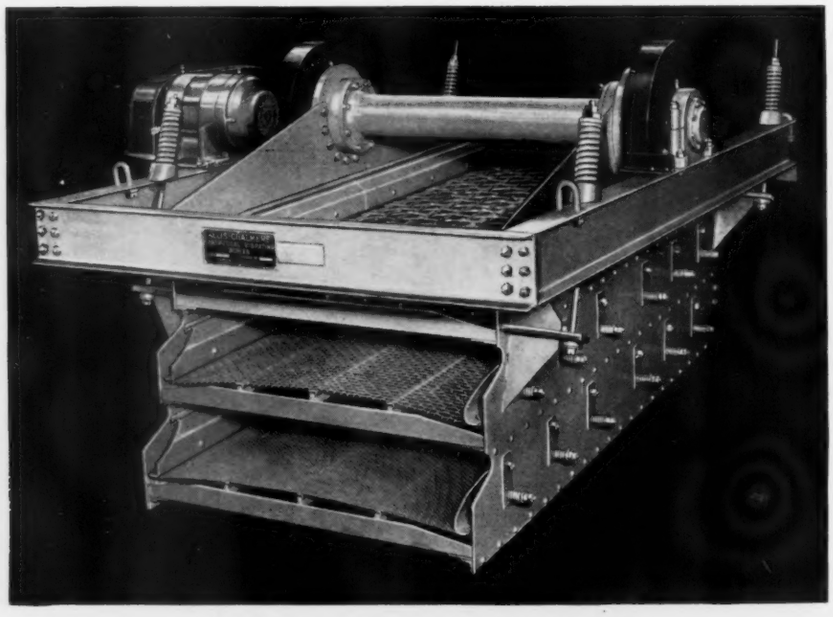
Style "B" Centrifugal screens are built with one, two, or three decks in sizes from 2 x 6 ft. to 5 x 14 ft. and are adaptable for heavy loads and the maximum range of material size. The screening action, which is equally intense for all tonnages, is transmitted to the Screen body or vibrating member by an eccentric shaft located above the screen and supported in anti-friction bearings. The screen body "floats" on balance springs reducing power and the load on the bearings; the entire screen is cable and spring suspended.



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Better hang on to them-

with the right set-up, these two cards will take the pot!

CB-35

Knowing when to discard and when to "play 'em," is the secret of success in poker—and business, too. A Quarry Man would hang on to these two cards because so much profit is tied up with "Easier Removal" and "Giant Blasts." Cordeau-Bickford Detonating Fuse has made the giant blast practical and popular in quarry work. If your set-up permits one big shot in place of a lot of little ones, you, too, can use Cordeau to good advantage.

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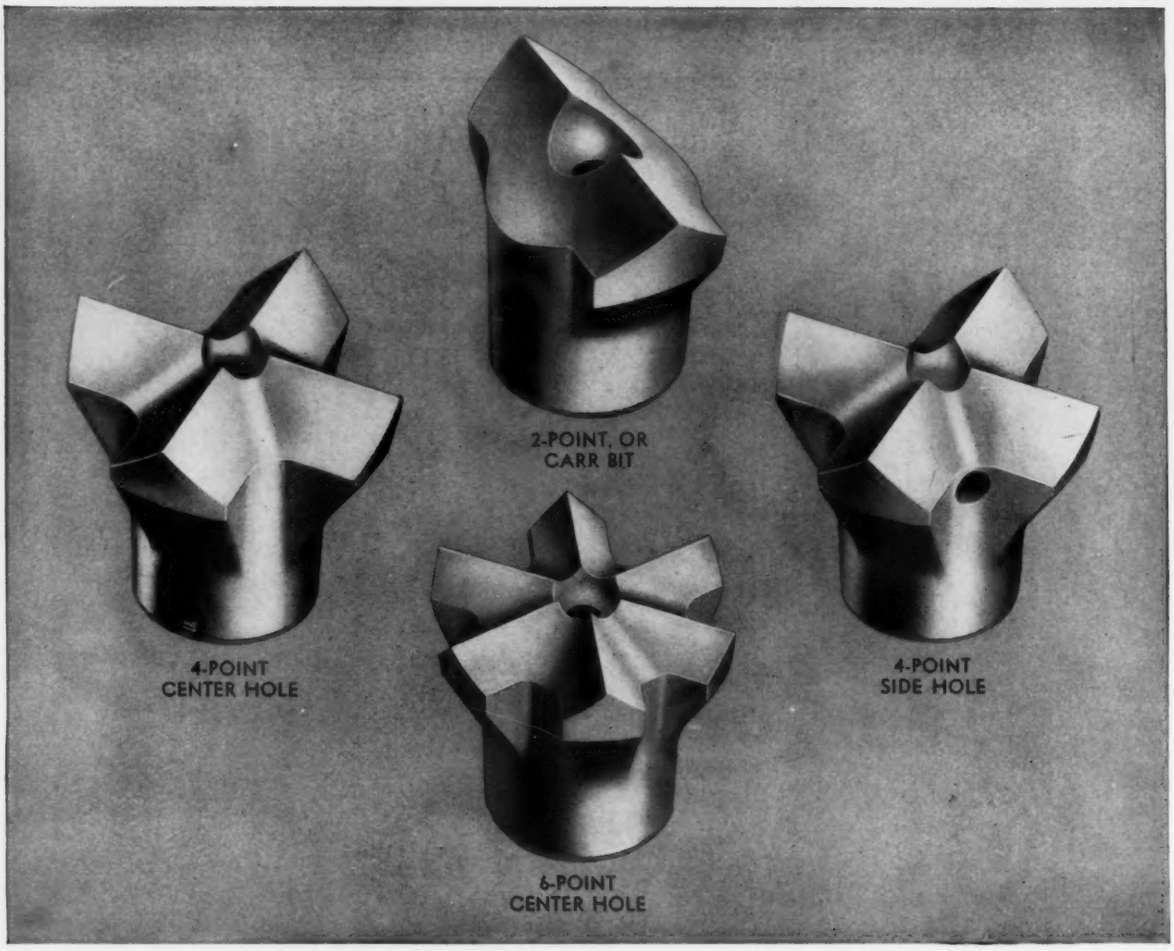

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86-5

BETTER PRODUCT = PROFIT

BONNOT REDUCTION CRUSHERS

MEET DEMAND

Product as made with standard type of jaw crusher. Note slabs and oversize. About 75% rejects and 25% finished product.

Strict present day specifications for crushed gravel and aggregates require a crusher that DELIVERS material of correct size—with high strength and bonding values, cubical in shape and free from flaws or incipient cracks.

The Bonnot Reduction Crusher —built to this demand—produces this extra quality material at lower costs per ton. Long life and minimum maintenance are assured by uniform distribution of wear and few wearing parts.

Product as made with Bonnot Reduction Crusher. Note absence of slabs, fines and oversize. About 85% finished product. Same material and setting.

1 —Utmost Simplicity

2 —Unusual Ruggedness

3 —Lowest Head Room

4 —Superior Lubrication

5 —Minimum Choking

6 —Extra Long Life

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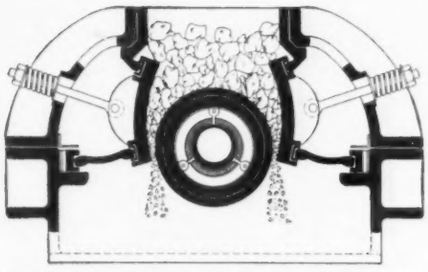
8 —Safety Plus

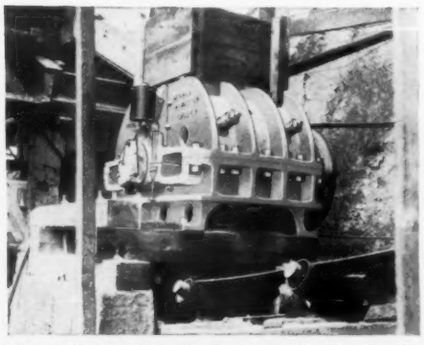
9 —Big—Quality Tonnage

10—Real Power Savings

Superiority of design, product and operating efficiency are fully analyzed in bulletin No. 160.



Not a roll crusher. Featuring slow creep mantle for distribution of wear.



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"Starts easily under full load"

The Bonnot Co.
Canton, Ohio

Gentlemen:

We have one of your 4½ x 24 Bonnot Reduction Crushers in operation at our plant, producing 1" minus material, and handling everything passing over 1½" screen up to 6" with crusher set at 9/16" close opening, and we are well pleased with its performance.

* * * We have been able to start the crusher with the crusher and surge bin full of rock without the necessity of cleaning out the crusher or the bin, as it starts very easily under full load.

We have been using gyratory and jaw crushers in our various plants and found it difficult to make material under 1". * * * The recent severe rain storms have aggravated the clay ball situation but up to date the crusher has handled this foreign material without plugging or choking.

* * * We take pleasure in recommending this reduction crusher because of its steady, smooth performance, its ability to produce uniform material meeting present day specifications, its ruggedness, simplicity and low head room. From an operating standpoint it should prove economical in regard to life of wearing parts, lubrication and power costs.

Yours truly,
THE UNITED SAND & GRAVEL CO.
By WM. TIMPE, Mgr.

Write for Bulletin No. 160

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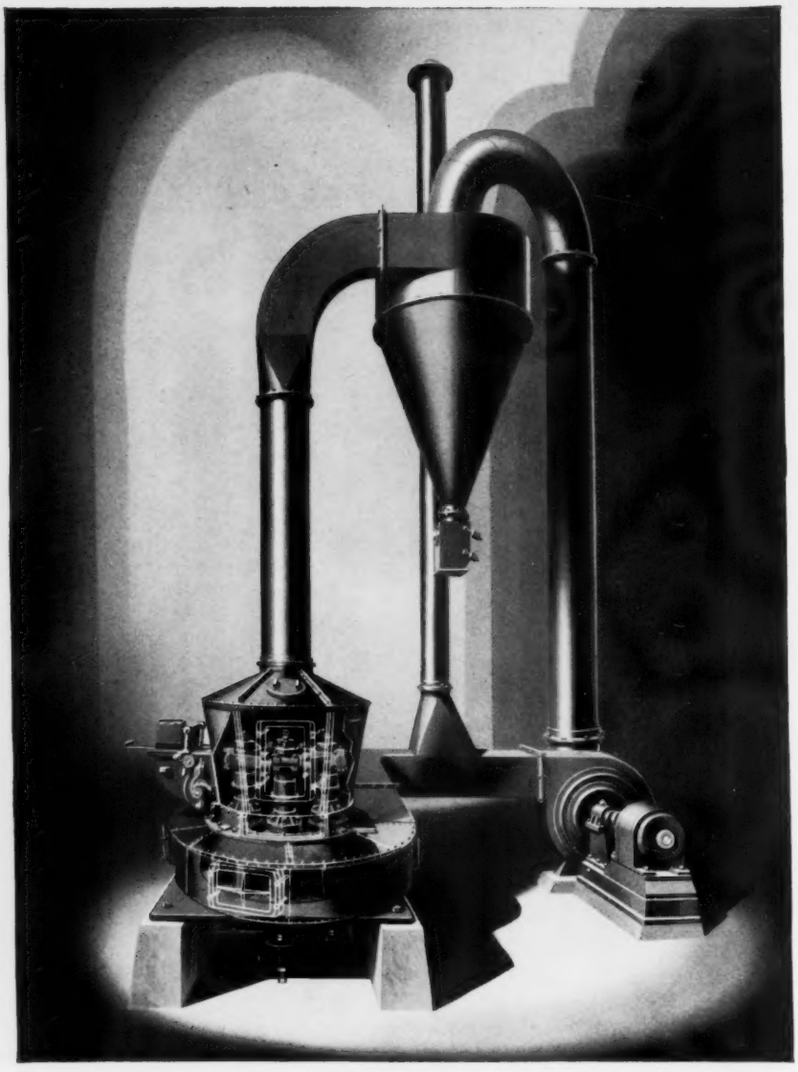

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You will find in the latest type of Raymond Roller Mill such important advantages as the *pneumatic feed control* for maintaining the output at maximum for all conditions of feed—*wide range classification* from the average commercial fineness up to 99.9% through 400 mesh for micron material—*available capacities* for all requirements up to forty tons per hour—*improved oil journal* that reduces maintenance and lubrication costs to new low figures.

In addition, consider the extra value of the Raymond Roller Mill, equipped as a Kiln Mill, to *dry and grind* in one operation, reducing by half the cost of pulverizing such materials as limestone, gypsum, clay and many other rock products.

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VOLUME 27 NUMBER 4

Pit and Quarry

With which is consolidated

CEMENT-MILL & QUARRY

CHICAGO, OCTOBER, 1934

NRA Approves Code of Cleft-Stone Industry

AVERAGING OF HOURS IN DOUBT

Approval of the code of fair competition for the natural cleft-stone industry, whose products commonly are termed flagstone, has been announced by Recovery Administrator Hugh S. Johnson. He stated, however, that he was extending his approval on the condition that the industry showed that the code's averaging provision regarding the maximum work week is necessary.

While announcement of approval was made by Gen. Johnson on Sept. 11, the provisions of the code did not go into effect until the 21st of that month.

Under the terms of the code the work week is limited to 40 hr., averaged over periods of 3 months, with a maximum of 48 hr. in any one week. Only 6 days may be worked in 7, and 8 hr. in any 24-hr. period. An exception is provided for emergency employees, but these workers must be paid at the rate of time and one-half for overtime. Exemption is made also for traveling salesmen, managers and executives earning a salary in excess of $35 weekly. Watchmen may work up to 56 hr. a week. Child labor is banned under the code.

A minimum wage of 40 c. per hr. is stipulated in all places of more than 2,500 population. In southeastern communities of fewer than 2,500 people 30 c. an hr. is provided, while 38 c. is called for in the northeast region.

Gen. Johnson told President Roosevelt in a special communication that the value of the industry's products suffered a sharp decline during the 1928-33 period. Where the value was estimated at $1,000,000 in 1928, figures for 1933 showed it had dwindled to approximately one-fourth of that amount. Employment was cut in halves during the period.

Not much could be expected in the way of increased employment during the present time, Gen. Johnson said. The only solution lies in increased construction activities, in the Administrator's opinion.

"The proposed wages, however, represent a marked increase and will restore the 1929 level of wages," Gen. Johnson added. "An appreciable part of the volume is produced by two- or three-man quarries or pits, working on shares. Much of this stone is sold for whatever it will bring, corresponding to very low wage rates. It is hoped the trade-practice provisions of the code will eliminate this situation."

Concrete Code Budget Is Given Approval by NRA

The N.R.A. has approved the budget for the ready-mixed-concrete industry as well as the method of assessment to be imposed on members of the trade to meet the $23,000 provided for code-administration expenses.

This sum will cover the period of one year beginning March 1, 1934. Members of the industry will pay 1½ c. per cu.yd. monthly, based on a monthly average of 1933 production for a period of 90 days, after which the matter will be reopened. At the same time an immediate contribution of $25 will be made by each member of the industry to apply against the final contribution.

Lime Maker Obtains NRA Exemption on Work Time

For a period of three months ending October 31, Brewer & Co., crushed-limestone producers and lime manufacturers of Worcester, Mass., have been exempted from compliance with the working-hours provisions of Art. II, Sec. 2 of the lime-industry code (No. 31). The exemption, which is contained in Administrative Order No. 31-14, dated September 5 and signed by Division Administrator C. E. Adams of the N.R.A., applies only to the company's New Haven, Vt., plant, the Green Mountain Lime Corp.

Add Crushing Equipment to Jersey Quarry Plant

★ The Jersey Quarry Co., Jerseyville, Ill., was recently organized for the operation of two stone quarries in Jersey County. The former Hickman quarry near Fieldon has been leased and has a capacity of 40 tons of dust and 60 tons of crushed stone per day. The other quarry several miles south of Fieldon has a capacity of 60 tons of dust and 300 tons of rock daily. A new crusher has been installed in this plant. Mrs. George Hoffstetter is president and George Hoffstetter is manager.

Contracts in August Slightly Above 1933

SHOW GAIN OVER JULY FIGURE

The volume of construction contracts placed during August was slightly higher than that reported for July and 13 per cent. greater than the total shown for August, 1933, according to F. W. Dodge Corp. Out of the August, 1934, volume of $120,244,500 a total of $51,046,800 was reported for non-residential building types; $41,905,900 for public works; $18,641,000 for residential buildings; and $8,650,800 for public utilities. The August totals for non-residential building and public works classifications were larger than in August, 1933, while for residential building and public utilities the respective totals were smaller than a year ago. For both residential and non-residential building the August totals were smaller than those reported for July.

FHA Lends $417,719 for Jobs Involving Cementing

A total of 72 cementing jobs were performed as a result of modernization and repair loans under the housing act, a Federal Housing Administration report as of September 21 disclosed.

While there may have been more jobs of this kind done up to that date, there having been several thousand loans reported to the F.H.A., the above estimate was arrived at through a study of 718 loans.

These loans provided a total of 1824 jobs, of which cementing had 3.95 per cent. Heating improvements lead the list of jobs with a percentage of 14.53.

The total value of the loans was $417,719, with an average dollar amount of $579 for each loan.

★ The Cold Spring Granite Co., Morton, Minn., has made a number of improvements to its plant at that location. New equipment purchased includes an air compressor and four drifter drills. Some of the buildings have also been enlarged.

★ The White Gravel Co., Camden, O., recently installed a 3-ft. by 4-ft. triple-deck Deister Machine Co. vibrating screen.

Workers Coerced into Joining Company Union

FIRM MUST HEED MEN'S CHOICE

The National Labor Relations Board has ruled that the North Carolina Granite Company, Mount Airy, N. C., violated the collective-bargaining clause of the National Industrial Recovery Act, and has ordered the company to answer, by Oct. 3, whether it will recognize the Mount Airy Branch of the Granite Cutters' International Assn. as the agency of its workers.

Unless that union is accepted as the bargaining representative of the employees, the board will refer the case to the Compliance Division of N.R.A. with a recommendation that proceedings be started to invoke the penalties of the National Industrial Recovery Act.

The board found that the company had failed to bargain collectively with the union when it represented a large majority of its employees, bribed one of its officers, and had by these and other unlawful tactics induced a large number of the employees to join a "company union," the Mount Airy Granite Workers' Assn. The board ordered that the "company union" be disqualified to serve as an agency for collective bargaining and that the company "recognize the G.C.I.A. as the representative of the employees for the purposes of collective bargaining until such time as the employees, without the interference, restraint or coercion of the company or its agents, choose some other representative."

The union has asked for a closed shop and a pay increase to $1 an hr., but this was rejected by J. D. Sargent, president and general manager of the quarries. Mr. Sargent, however, soon negotiated a 75 c. wage with the "company union" which, it was claimed, was very speedily organized. The president of that group claimed it was in process of formation for many months, with numerous conferences taking place in the back room of a local meat-market.

"Even if we accept this rather dubious explanation of the origin of the Association," said the board, "the negotiation of a contract with a self-appointed committee, even before it was agreed to by any considerable number of employees and before the organization itself was formed, clearly indicates that the company embraced the association with curious speed and enthusiasm."

After citing incidents which, to the satisfaction of the board, indicated too close a connection between the company and its own union to have the latter fairly representative of the employees, and relating instances of alleged discrimination against members of the outside union, the board's decision goes on to say:

"A final instance of Sargent's dealings with the G.C.I.A. was his agreement to pay R. K. Mitchell, secretary of the local, the sum of $200 to use his influence to prevent the occurrence of the threatened January strike and 'to keep things running smoothly here.' The details of this transaction are provided by Sargent himself. Some days before the strike, at a conference arranged pursuant to a request by Mitchell, Sargent 'agreed to pay something' when Mitchell 'suggested that he had the wires and could control the situation and could prevent a strike.' Of the sum promised $100 was paid out of the company's funds prior to the strike. After the strike, on Mitchell's demand, Sargent 'rather reluctantly gave him $50 to close the account, as I thought,' although he had at first refused to pay Mitchell anything additional, saying 'You didn't prevent the strike, I don't owe you anything.'"

Concluding its summation of the facts, the board states: "It is impossible to regard this transaction as anything but a flagrant interference by Sargent with the right of his employees to strike and to agitate by other lawful means in advancing their legitimate self interest."

Rarey Appointed Head of Ohio Adjustment Agency

For the purpose of considering complaints of alleged violations of the mineral-aggregates code (No. 109) the Regional Committee of Region 8 (Ohio) has appointed the following Regional Adjustment Agency, as reported by Executive Secretary Claude L. Clark:

Russell Rarey (chairman), Marble Cliff Quarries Co., Columbus, O.
W. E. Bliss, Standard Slag Co., Youngstown, O.
E. L. Flad, Carnegie Steel Co. (Slag Dept.), Pittsburgh, Pa.
William E. Hole, American Aggregates Corp., Greenville, O.
Fred Hubbard, Canton Slag Co., Youngstown, O.
H. M. Sharp, France Stone Co., Toledo, O.
R. G. Spencer, National Lime & Stone Co., Findlay, O.
Stephen Stepanian, Arrow Sand & Gravel Co., Columbus, O.
Earl Zimmerman, Ohio Gravel Co., Cincinnati, O.

Lehigh Buys Separators for Iola, Kansas, Plant

★ The Lehigh Portland Cement Co. recently improved the air-separation equipment in its Iola, Kan., plant. The improvement comprises three new 14-ft. separators operating in the clinker-grinding department. The machines were furnished by the Sturtevant Mill Co.

Norristown Plant Gets Dust-Collecting System

★ Yoch and Roberts, crushed stone producers of Norristown, Pa., are installing a complete Northern Blower Co. dust-collecting system in their plant at that location.

Approves Stone-Code Budget Conditionally

COSTS 5 CENTS PER 1000 TONS

Conditional approval of the $836,101 budget for the crushed-stone, sand-and-gravel and slag industries has been granted by the N.R.A. Of this amount $189,500 is set aside for expenses of the Code Authority, while $646,600.91 is allocated for the expenses of the various regional, state, district and divisional committees.

The N.R.A. said a lump sum of $227,440 requested for local group expenses, exclusive of the $646,600.91, was disapproved specifically until it was broken down in detail. In order to conserve time, however, the N.R.A. granted permission to the Code Authority to approve the detailed budgets for the remainder of the local groups, subject to disapproval by the Administrator.

The method of assessment upon members of the industries to meet the code expenses will be the levying of 5 c. per 1,000 tons produced in the calendar year 1932.

The portion of the budget approved was subject to the following chief provisos:

An audit must be made within 60 days from the time of the approval (Sept. 11), which is to be submitted to the N.R.A.;

The Code Authority must report to the N.R.A. by Jan. 1, 1935, in a more economical administration of the code through consolidation of administrative agencies and other means;

Funds of all local groups must be safeguarded;

Expenses of all local groups must be kept within their income;

The Code Authority must submit an itemized and audited statement of the expenses entailed in the code's establishment.

Work Progresses on New Mexico Potash Refinery

★ It is reported that construction work on the new refinery of the United States Potash Co., near Artesia, N. M., is nearly completed. Among the new equipment installed recently is a large turbine. The last building completed is a warehouse 80 ft. wide by 250 ft. long, which was built with no inside pillars.

Building New Sand-and-Gravel Plant in Oregon

★ The Independence Sand & Gravel Co., Independence, Ore., has been purchased by John R. Dickson, Portland, who is proceeding with the erection of a new plant on the property in order to furnish material for a two year contract. G. C. Skinner is plant superintendent.

Appeals Board Denies Hand-Quarries' Plea

WAGE EXEMPTION NOT PROPER

Declaring that there is no well-defined line of demarcation between machine-loading quarries and hand-loading quarries, the Industrial Appeals Board has rejected a petition filed by the Eldred Crushed Stone Co. and the Staunton Tie & Lumber Co. for exemption from the aggregates code's labor provisions.

In so holding the board, which is the successor of the Darrow board created to insure against the oppression of small industries, sustained the industry's code authority and the National Recovery Administration, each of which had ruled against the petitioners and had said no differentiation in wages and hours can be supported on the ground that one type of quarry uses machinery more generally than another.

To grant the exemption asked, the board declared, might undermine code operations without doing any substantial good.

"We are forced to the conclusion that many of them (the so-called hand-loading quarries) are, in reality, operating plants and deposits which, for inherent reasons, can not compete successfully with other more efficient plants in the industry," said the board.

The appeal was taken in behalf of all the plants claiming to be hand-loading quarries, but with the Eldred and Staunton companies the nominal appellants, after Assistant Deputy Administrator R. L. Plimpton had ruled against granting the exemption asked.

Following is the text of the decision:

The appellants are operators of plants in the crushed-stone, sand-and-gravel and slag industries. A petition was originally filed by 25 quarry owners seeking exemption from the applicable minimum-wage rate provided by the code. This petition was denied by the code authority and by the Assistant Deputy Administrator. On July 17, 1934, the appeal was filed with this board, and on August 8, 1934, a hearing was held thereon at which time two of the appellants appeared in person and a third filed a statement. [See p. 23 of PIT AND QUARRY for September, 1934.—ED.]

At the hearing before this board, as well as at the previous hearings, it was argued on behalf of the petitioners that their businesses were "hand-operated" plants, which could not pay the same minimum wages as the "machine-operated" plants, which only require about one-seventh of the number of employees per ton produced. Nineteen of the 25 original petitioners were from District No. 9, in which there appear to be from 500 to 600 producers, not more than 100 of whom have an output in excess of 25,000 tons per year. The remainder are of the same general type as most of the petitioners. Some of the petitioners have highly-mechanized plants. One has a plant with a capacity of approximately 75,000 tons per year.

It appears that there is no clear line of demarcation between hand- and machine-operated plants. All plants use some machinery; all plants use some hand labor. Any definition designed to catalog plants in one or the other of the two categories would apparently be extremely difficult to administer and lead to abuses. The testimony given by the two appellants who put in personal appearance showed that the plant of one is engaged in operating a deposit which contains more than the usual amount of impurities and waste materials; that the other produces as a major product agricultural limestone which is generally put on the market as a by-product.

The plight of the appellants who are threatened through economic forces with the necessity of having to close their plants is appalling. There is no indication, however, that this condition was brought about by the code. The evidence given by one of the petitioners himself shows that even in 1933, when his wage rate was one-half of the minimum scale now in effect under the code, he was unable to compete. It is doubtful that the exemptions sought would be sufficient to enable many of the petitioners to meet the competition to their business. We are forced to the conclusion that many of them are, in reality, operating plants and deposits which, for inherent reasons can not compete successfully with other more efficient plants in the industry. The wage scale has been agreed upon by the overwhelming majority of producers and the granting of an exemption to these appellants might undermine the entire standards of the minimum-wage rates provided for in the code, without producing any general public benefit.

Material Purchases of PWA Increase in June

$20,030,852 TOTAL FOR MONTH

Public Works Administration purchases of nonmetallic minerals and their products exceeded $20,000,000 in the month ended June 15. The actual total, $20,030,852, was almost double the May figure and nearly one-third of the total for the preceding eight months. It is estimated that $12,150,000 of the total mentioned was spent for public-roads materials, for which, unfortunately, no analysis by kind of material is available.

Of the $7,880,852 spent for nonmetallic minerals on account of P.W.A. projects other than roads $4,601,543 went for cement. Not only was this the largest one-month expenditure for cement in the history of the P.W.A., but it exceeded by more than half a million dollars the previous 8-month total.

Sand-and-gravel purchases ranked second at $792,526, and marble, granite, slate and other stone products third at $637,880. Only $94,896 was spent for crushed stone, although this was the largest single month's purchases in 9 months.

The accompanying table shows the month-by-month record of purchases of ten different nonmetallic minerals and the 9-month totals. Public-roads material purchases in the 9 months shown were nearly twice as great as those for P.W.A. projects other than roads.

Buys Drier and Cooler for Making Silica Sand

★ The Pittsburgh Plate Glass Co., Crystal City, Mo., has completed an extensive improvement program at its silica sand plant there. Included in the new equipment is a Ruggles-Cole 80-in. by 55-ft. rotary drier with a special cooling device.

NONMETALLIC MINERALS AND THEIR PRODUCTS PURCHASED FOR PUBLIC-WORKS PROJECTS IN 1933 AND 1934, BY MONTHS

Material	Month Ended												Totals (8 months)
	Oct. 15, 1933	Nov. 15, 1933	Dec. 15, 1933	Jan. 15, 1934	Feb. 15, 1934	Mar. 15, 1934	Apr. 15, 1934	May 15, 1934	June 15, 1934	July 15, 1934	Aug. 15, 1934	Sept. 15, 1934	
Cement	$71,373	$366,384	$361,635	$370,668	$444,559	$371,665	$1,264,718	$ 831,238	$4,601,543	.....	.....	.....	$8,683,781
Sand and gravel	13,164	107,453	313,009	283,483	289,677	240,309	328,075	1,797,504	792,256	.....	.....	.....	4,155,200
Crushed stone	90,301	23,074	40,880	56,675	19,517	31,383	85,604	56,068	94,896	.....	.....	.....	498,398
Marble, granite, slate and other stone products	38,787	403,924	1,713,412	513,900	368,201	209,684	401,386	620,183	650,572	.....	.....	.....	4,920,049
Clay products	39,735	152,717	254,685	260,434	234,522	327,051	426,879	509,865	567,847	.....	.....	.....	2,733,735
Concrete products	19,059	644,544	703,572	517,354	412,052	351,284	392,902	501,824	637,880	.....	.....	.....	4,180,571
Glass	.....	.....	18,254	72,068	.....	11,384	29,421	41,152	28,658	.....	.....	.....	200,937
Paving materials and mixtures	43,244	178,268	135,289	133,857	113,870	138,865	297,062	205,603	241,747	.....	.....	.....	1,487,785
Roofing, asphalt shingles, etc.	.....	53,595	39,261	74,919	53,009	229,370	132,024	120,501	121,928	.....	.....	.....	824,607
Wall plaster, wall board, etc.	.....	.....	14,935	32,814	73,021	56,062	85,671	114,202	143,355	.....	.....	.....	520,060
Totals	$315,663	$1,929,959	$3,594,932	$2,316,172	$2,008,428	$1,967,057	$3,443,742	$4,798,140	$7,880,852	.....	.....	.....	$28,254,495
Public roads projects[1]	(2)	(2)	(2)	2,819,250	2,857,500	3,330,000	4,950,000	7,650,000	12,150,000	.....	.....	.....	54,269,767
Grand totals	(3)	(3)	(3)	$5,135,422	$4,865,928	$5,297,057	$8,393,742	$12,448,140	$20,030,852	.....	.....	.....	$82,524,712

[1] Not available by type of material. These figures represent 45 per cent. of the totals, as approximately that portion is spent for cement and aggregates.
[2] Not available for this month separately.
[3] See Note 2.

Housing Plan Offers Big Material Market

INDUSTRIES MUST SUPPORT IT

Urging all Portland-cement, lime, gypsum, lumber, millwork, concrete-masonry, plastering, limestone, structural-steel and structural-clay-products manufacturers to "get their share" of a potential $1,600,000,000 market, officials of the Federal Housing Administration outlined a general campaign for members of these industries for carrying the aims of the housing drive to success.

Meeting in Washington on Sept. 13, executives of these industries heard important F. H. A. officials discuss the provisions of the housing act and the procedure whereby home owners seeking to reconstruct their properties could secure loans.

The fundamental step in making the program successful lies in the coöperation of these manufacturers, the executives were told by Ward M. Canaday, public relations director. This was echoed by Roger Steffan, director of the Modernization Credit Division, Albert L. Deane, deputy administrator, and W. T. Flanders, director of the F. H. A. Field Division.

"The success of the program will be measured by your success in your communities and in your industries in getting behind this program the entire industrial interests of America, because it is the motive power of selling goods, the motive power of selling for a profit the products that you make, that must supply the public interest through which the people's minds will be made up," Mr. Canaday declared.

Every employer, he continued, can lend his own, personal, active support to the development of the local campaign in his town.

"He can suggest," Mr. Canaday stated, "that the same thing be done by his employees and by the dealers representing him. He can call his salesmen in and tell them that when they go into a town where these community campaigns are being organized they should give their support and their coöperation to those campaigns. By that coöperative effort, combined and multiplied in 200,000 manufacturing establishments and thousands of stores throughout the country, you get a rolling snowball that nothing can stop."

Mr. Canaday concluded by urging all manufacturers with either national, semi-national or local distribution to start looking over their products and plans to see whether they are putting on as aggressive sales drives as is possible.

"Already more than one thousand campaigns have been launched and within a few days many of these campaigns will be under way," he said. "They are going to put demands on your production and if you are behind the procession, if your organization is not alert to the opportunity, then the fellows who are volunteering in their communities to get this thing going and to be helpful are going to be put in a position of dragging your dealers down the street instead of these dealers being out in front of the parade leading."

Mr. Steffan told the executives that the F. H. A. was doing everything it could to secure the coöperation of the banks throughout the country to loosen credit for home construction.

He said there were at least two bankers of prominence in each state who were working for the purpose of educating their colleagues in the operation of the housing act. He drew a picture of complete coöperation among the F. H. A., a state organization, representatives of bankers associations and building-and-loan associations. He warned the gathering, however, that a large part of the burden will fall upon the manufacturers themselves.

"Now I am quite sure you can not expect the banks to carry the lead," Mr. Steffan said. "They are not going to advertise this thing, although many have done so to my surprise. They are not going to reach out and do the job of any manufacturer, dealer or contractor. They are going to do enough if they approve a fair percentage of the loan applications.

"The real stimulus has to come from those who have products to sell and if in any locality there is a bank slow to respond or a bank that does not thoroughly understand, I say it is your job and the job of any organization expecting to do business to help show the banks how it is to be done."

At the present time there were 7,000 coöperating banks already on the F. H. A. roster with a goodly number continuing to come under the plan daily.

Mr. Deane expressed the opinion that the banks have shown considerable enthusiasm and felt that most of the financial institutions would be willing to coöperate as quickly as they were thoroughly informed of the provisions of the plan.

"It will take time," he asserted, "but the time element can be cut down to the extent that you are able through your organizations and those of other manufacturers to put forth sales-promotional efforts on the banks themselves."

It is impossible, he contended, for the F. H. A. to go in and do the kind of selling job that the manufacturers' own salesmen are forced to perform with their own customers.

"One of the first things you can do is not only tell your salesmen how they can take advantage of the plan in connection with the sale of the products but how they can convince banks that they ought to come in," Mr. Deane added.

The F. H. A. at present has an organization of 57 units scattered throughout the country with 10 regional headquarter points.

Jobs for 212,544 Men on PWA Road Projects

WORK DONE COST $192,653,000

Progress made on the emergency construction of public-works highways to September 22 under the supervision of the United States Bureau of Public Roads shows a total of 581 projects, estimated to cost $27,032,000, approved but contracts not yet awarded; 386 projects, estimated to cost $13,688,000, awarded but not yet under construction; 3,186 projects, estimated to cost $209,149,000, under construction; and 4,955 projects completed at a cost of approximately $192,653,000.

The 3,186 projects under construction involve 8,978 mi. of road and are giving regular direct employment to 212,544 men.

The above figures include projects involving funds provided by the Acts of June 16, 1933, and June 18, 1934.

High-Speed Trains Make New Market for Ballast

Immediate improvement of railway equipment throughout the country to insure safety at a sustained speed of 100 miles per hour was foretold by Elmer T. Howson, president of the Roadmasters and Maintenance of Way Assn., at its 49th annual convention held Sept. 18 in Chicago. Mr. Howson, who is editor of Railway Age, stated that a special roadbed is necessary for high speeds. Among the projected improvements of this type to be started soon he mentioned the C. B. & Q. Ry. between Chicago and St. Paul, the Boston & Maine Ry. between Boston and Bangor, the New Haven between New York and Boston, the B. & O. between New York and Washington, the Illinois Central from Chicago to St. Louis, and the G. M. & N. between Mobile and Jackson, Tenn. H. R. Clarke, engineer in charge of maintenance for the C. B. & Q. Ry., said that his road would have high-speed trains in operation between Chicago and St. Paul by spring.

Roller Mill Bought for Limestone at Thomaston

★ The Lawrence Portland Cement Co., Thomaston, Maine, recently installed a new Raymond roller mill equipped with a Whizzer separator for grinding limestone. The lime hydrating plant operated by the company is being rebuilt and additional equipment installed.

★ The New Jersey Pulverizing Co., New York, N. Y., has installed two Sturtevant separators which are used for classifying pulverized silica in its plant at Pinewald, N. J.

★ The Tecumseh Gravel Co., Tecumseh, Mich., is reported to have installed an Allswede scrubber.

Gasoline Taxes Again Over Half-Billion Mark

NEW YORK HEADS STATE LIST

State gasoline taxes in the calendar year 1933 yielded a revenue of more than $519,000,000 as compared with $514,138,900 in 1932, according to reports collected from state authorities by the Bureau of Public Roads, United States Department of Agriculture. This figure does not include tax returns from the Federal gasoline tax.

The consumption of gasoline exceeded 14,000,000,000 gal. and was slightly less in 1933 than in the previous year. The weighted average tax rate was 3.65 c. per gal. There was a noticeable increase in the diversion of funds to other than highway purposes and also an increase in the funds allocated to local roads.

The total revenue was allocated as follows: To state highways, $277,517,371; to local roads, $111,109,158; to state and county roads, bond payments, $58,972,767; to city streets, $13,334,180; to costs of collection and administration, $2,727,801; and to other than highway purposes, $55,742,173.

Gasoline tax revenues by states were as shown in the accompanying table.

GASOLINE TAX COLLECTIONS IN 1933 BY STATES

State	Total Tax Receipts (refunds deducted)	Tax Rate on Dec. 31, 1933 (*cents*)	Net Amount Taxed (*gallons*)	Change in Consumption from 1932 (*per cent.*) (Increases in bold-faced type)
Ala.	$ 8,033,142	6	133,885,679	1.86
Ariz.	2,679,257	5	53,580,633	7.63
Ark.	5,998,290	6	114,791,930	**33.35**
Cal.	35,217,162	3	1,173,905,406	2.52
Col.	5,324,996	4	133,124,908	2.64
Conn.	4,857,024	2	240,581,476	**2.71**
Dela.	1,129,577	3	37,577,673	**3.41**
Fla.	14,292,873	7	203,561,549	1.79
Ga.	12,634,513	6	210,575,216	**5.83**
Ida.	2,283,166	5	45,647,396	**0.20**
Ill.	27,833,011	3	927,767,039	3.20
Ind.	16,288,646	4	407,080,056	2.73
Ia.	9,372,343	3	312,411,442	**4.48**
Kan.	7,771,369	3	257,727,287	**4.20**
Ky.	8,316,017	5	166,293,182	**1.36**
La.	8,156,436	5	163,138,863	1.73
Me.	4,126,640	4	102,009,277	3.00
Md.	7,207,749	4	180,193,738	3.90
Mass.	16,377,352	3	545,911,726	0.86
Mich.	19,485,320	3	648,615,259	4.76
Minn.	10,213,636	3	333,828,560	**0.14**
Miss.	6,100,948	6	96,695,407	0.04
Mo.	9,081,135	2	454,056,751	**1.47**
Mont.	2,751,303	5	55,026,065	**2.27**
Neb.	7,706,261	4	192,656,526	1.32
Nev.	695,653	4	17,391,339	4.33
N. H.	2,349,849	4	58,746,216	10.95
N. J.	16,470,647	3	546,579,541	1.32
N. M.	2,281,892	5	45,310,187	**3.34**
N. Y.	43,392,946	3	1,444,837,830	2.71
N. C.	14,773,282	6	246,160,036	**6.23**
N. D.	1,924,830	3	64,131,714	**4.81**
Ohio	33,939,981	4	838,020,083	2.18
Okla.	10,078,645	4	251,617,119	**4.18**
Ore.	6,343,891	5	135,819,611	3.03
Pa.	31,059,378	3	1,024,637,243	**1.48**
R. I.	1,884,682	2	94,048,613	**1.45**
S. C.	6,679,326	6	111,322,101	**7.30**
S. D.	3,346,015	4	78,382,211	**5.80**
Tenn.	12,979,882	7	185,426,887	**6.52**
Tex.	28,479,350	4	711,983,752	**5.23**
Utah	2,189,714	4	54,724,960	**0.79**
Vt.	1,766,152	4	44,153,789	5.79
Va.	11,082,040	5	221,640,804	**2.52**
Wash.	10,863,214	5	217,264,282	1.66
W. Va.	4,927,728	4	122,991,600	0.45
Wis.	15,169,426	4	379,235,644	**1.48**
Wyo.	1,405,415	4	35,135,367	0.90
D. C.	2,082,346	2	104,117,297	**2.30**
Total.	519,403,450		14,224,321,270	0.18

Trophy Rededicated by Lone Star Cement Plant

The Lone Star Cement Co., Kansas, on Saturday, August 18, rededicated the Portland Cement Assn. Safety Trophy at its plant at Bonner Springs, Kans., which was won for the third time in succession in 1933. The ceremony held in conjunction with the rededication was attended by more than 700 people, including all the plant and Kansas City office employees of the company and their families, city officials of Bonner Springs, state highway officicals, representatives of ther cement mills in that territory, etc.

Speakers included J. A. Lenahey, vice president of the company; H. H. Small, district engineer for the Portland Cement Assn.; Lee Weeks, City Attorney of Bonner Springs; Frank C. Lynch, local director for the Kansas City Safety Council, and others. Music was supplied by the local band and barbecue refreshments were served.

Region 12 Adjustment Agency Gets NRA O.K.

The formation of a Regional Adjustment Agency for the 12th region (Nebraska and Iowa) having been approved by the Trade Practice Complaints Committee of the mineral-aggregates industry's Code Authority, its organization has been undertaken and completed in accordance with the provisions of Bulletin 7 of the National Recovery Administration. The agency is composed of the following members:

W. M. Stoner (chairman), Reiners-Kaufman Co., Lincoln, Neb.
R. C. Fletcher, Flint Crushed Gravel Co., Des Moines, Ia.
H. E. Schellberg, Western Limestone Products Co., Omaha, Neb.
C. E. Thomas, Ideal Sand & Gravel Co., Mason City, Ia.
W. T. Kelley, Des Moines, Ia.

Complaints should be sent to the chairman, P. O. Box 1546, Lincoln, Neb.

Cement Shipments in August Exceed Output

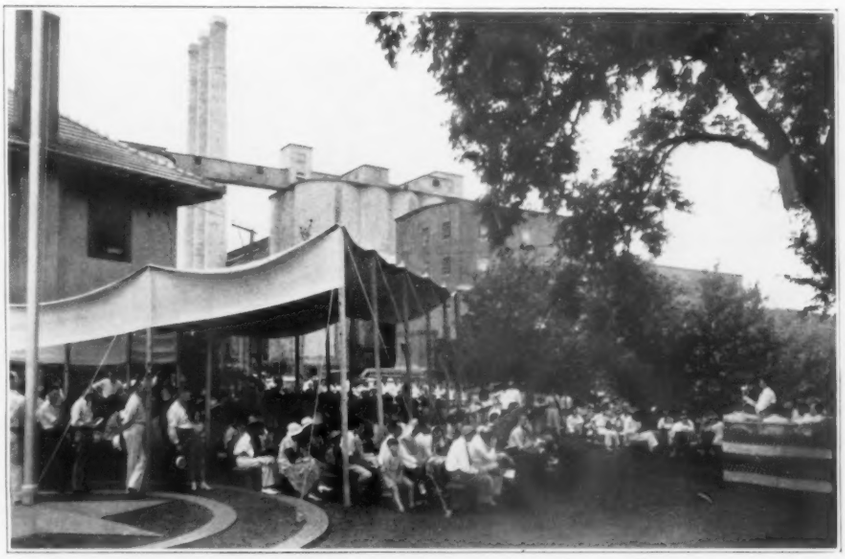
PLANTS ENCOURAGED TO REOPEN

Ordinarily at this season of the year cement production is decreasing rapidly and many plants are shutting down for the season. Production figures for August, however, show that shipments exceeded production in that month and this has undoubtedly encouraged many companies to continue production at an unabated rate. Judging from the number of plants which resumed production in the last month the production for September will also show little decline from the season's peak. The plants which reopened during September included the Universal Atlas Cement Co., Ilasco, Mo.; Alpha Portland Cement Co., Cementon, N. Y.; Lehigh Portland Cement Co., Mason City, Ia., and Mitchell, Ind.; Lawrence Portland Cement Co., Northampton, Pa.; Columbia Cement Co., East Fultonham, O.; Oregon Portland Cement Co., Lime, Ore.

NRA Approves Premixed-Concrete Code Authority

The Administrator of the N. R. A. has approved the Greater Cleveland Marketing Area Committee for the ready-mixed-concrete industry. Its members are:

Region 1.—P. F. Ayer, Boston Sand & Gravel Co., Boston, Mass.
Region 2.—J. E. Burke, J. K. Davison & Bros., Pittsburgh, Pa.
Region 3.—J. E. Donelson, Sloss-Sheffield Steel & Iron Co., Birmingham, Ala.
Region 4.—A. C. Avril, Avril Tru-Batch Concrete, Inc., Cincinnati, O.
Region 5.—J. L. Shiely, J. L. Shiely Co., St. Paul, Minn.
Region 6.—C. H. Makins, Makins Sand & Gravel Co., Oklahoma City, Okla.
Region 7.—R. E. Tremoureux, Golden Gate Atlas Materials Co., San Francisco, Cal.



Ceremonies commemorating third successive no-accident trophy winning by Lone Star cement plant at Bonner Springs, Kan.

Editorials

Adaptability Is Not Despotism

ONE of the chief objections raised against the provisions of what has come to be known as the "new deal" is its almost total disregard of precedent. Among the members of the legal profession, than whom there is probably no more precedent-ridden agglomeration of minds, there is a strong and outspoken resentment toward the "radical" departures embodied in the legislation which gave birth to "new deal" methods and manifested in the administrative practices which have resulted from the granting of new powers to government departments. Besides this inculcated reverence for precedent *per se*, the legal profession suffers from another serious disadvantage, which makes it impossible for it to view new conditions and new procedures with an open mind. Any change in the existing system of granting and exercising legal powers—and especially, as in the present case, when the modification results in a simplification of legal procedure through the transfer of certain powers from the judicial to the executive or administrative departments of the government—is certain to arouse the antagonism of the legal profession, which is no less mindful of economic advantage than its less sedate brethren in other walks of life. The farther such alterations impinge or, more properly, infringe upon the domain of economic development which these gentlemen of the bar have marked out as their special field of exploitation, the louder will be the cry of opposition to what will be picturesquely described as a "violation of long-established usage," the "death of the constitution," and so on.

It was doubtless something of this feeling, or an undercurrent of fraternal sympathy for the profession that hung upon his words, which prompted Gordon Hewart, lord chief justice of England, some years ago to write his book, *The New Despotism*, a scathing attack on the growing tendency to delegate what were looked upon as judicial powers to administrative officials of the government. "A little inquiry will serve to show," he wrote, "that there is now, and for some years past has been, a persistent influence at work which, whatever the motives or intentions that support it may be thought to be, undoubtedly has the effect of placing a large and increasing field of departmental authority and activity beyond the reach of the ordinary law." Certainly it was largely this same feeling which evoked the recent report of an American Bar Association committee, whose comments may be summarized in its own words: "Federal administrative agencies exercising judicial, in combination with legislative and executive powers, are obliterating essential lines of our government structure and, for the original classic simplicity, are substituting a labyrinth in which the rights of individuals, while preserved in form, can easily be nullified in practice." These worthy guardians of the law, adopting the pose of disinterested regard for the public good and basing their argument—as capable lawyers always can—on the emotion-stirring theme of the "rights of individuals," probably fear nothing more serious than a diminishing need for their professional services.

This tendency toward the overlapping and combination of duties and prerogatives which, under the old theory of the separation of powers, would have been considered heresy of the deepest dye, is nothing new or unheard of. In continental Europe the powers of administrative officers have generally been greater than in either England or America, but even in these countries, despite their belief in the superior value of the rule of law, the tendency toward limiting judicial review to legal questions concerning scope of authority and constitutionality has grown steadily. In the eighth edition of his *Introduction to the Study of the Law of the Constitution*, which appeared in 1915, A. V. Dicey said that "the ancient veneration for the rule of law has in England suffered during the last thirty years a marked decline." And he added, "The truth of this assertion is proved by actual legislation, by the existence among some classes of a certain distrust both of the law and of the judges, and by a marked tendency towards the use of lawless methods for the attainment of social or political ends." In America, as well as in England, this change has been inevitable, and as early as 1880 American courts began to recognize it. Public-utility regulation placed new responsibilities on administrative bodies and the resulting readjustments had their effect on legal decisions.

No less a legal authority than Roscoe Pound has pointed out this inevitability. "The need for individualization," he has said, "the call for speedy determinations, the demand for direction and guidance in advance of action, instead of leaving enterprises to guess at the way in which courses of action will be regarded judicially after the event, with such expert advice as they may be able to secure, can be met only by administrative methods and require a large measure of freedom of administrative determination and a wide discretion in administrative officials."

This view of the matter prevails in legal circles in England, where the charges made by Lord Hewart were investigated by a Committee on Ministers' Powers, appointed by the lord high chancellor. Its report pointed out the inevitability of this delegation of powers and said that "it is a natural reflection, in the sphere of constitutional law, of changes in our ideas of government which have resulted from changes in political, social and economic ideas, and of changes in the circumstances of our lives which have resulted from scientific discov-

eries." There is no "ground for a belief that our constitutional machinery is developing in directions that are fundamentally wrong," says the report—a truly significant opinion in a country that is looked upon as the home of constitutional government.

The belief that government agencies and the constitutional sanctions which engender and empower them must evolve in harmony with changing conditions should not appear new to anyone familiar with the history of constitution making in America. Despite the many differences of temper, experience, interest and purpose disclosed by the fifty-five men who shared in framing the federal constitution, they agreed on at least one point—the inevitability of change—and they provided for it. On this necessity Alexander Hamilton wrote: "We must bear in mind that we are not to confine our view to the present period, but to look forward to remote futurity. . . . Nothing, therefore, can be more fallacious than to infer the extent of any power to be lodged in the national government, from an estimate of its immediate necessities. There ought to be a capacity for future contingencies as they may happen; and as these are illimitable in their nature, so it is impossible safely to limit that capacity." "The real friends of the constitution in its federal form, if they wish to be immortal," said Jefferson, "should be attentive, by amendments, to make it keep pace with the advance of the age in science and experience." And John Marshall, perhaps the greatest of constitution defenders, said, in speaking of this provision for amendment, "To have prescribed the means by which government should, in all future time, execute its powers, would have been to change, entirely, the character of the instrument, and give it the properties of a legal code. It would have been unwise to attempt to provide, by immutable rules, for exigencies which, if foreseen at all, must have been seen dimly, and which can best be provided for as they occur."

America is no longer a country whose political needs are based on an agricultural and rural economy. A highly urbanized and industrialized nation requires a government whose principals, powers and procedures are attuned to the demands of the day. It is not only natural but also proper that government machinery should be sufficiently flexible to adapt itself, as does business machinery, to the changing needs of changing times. That the present government is displaying that degree of adaptability should give cause for satisfaction, not misgiving.

The "Independent" Press Again

SOME of our well-meaning friends have chided us for our lack of fervor in championing the right of freedom of the press. One of them says he fails to detect in our attitude, as expressed in recent editorials dealing with that subject, the faith in that principle which he would expect every journalist to display, "especially when there is grave danger that it may be impaired or abrogated."

Some interesting developments which have occurred behind the scenes in recent months, and which, it seems almost needless to say, are unknown to most readers, may serve to inject an element of caution into the minds of those who look upon journalists as unexceptionally devoted to the promotion of the public good. We touch upon them here merely for the purpose of moderating, if that be possible, some of the naïve trust which too many people have come to place in professional gatherers of news and in organs of opinion.

A national publisher's association, in announcing its coming annual meeting, draws attention to several matters of interest to present and prospective members and offers the following comment regarding some of its recent accomplishments:

Wagner Labor Bill.—This legislation as proposed would have been very costly to all publishers whether or not they operate their own printing plant. We took a very active part in killing this legislation.

Tugwell Pure Food and Drug Bill.—As originally proposed, this legislation would have been a serious blow to all advertising. Your committee and executives were finally successful in modifying this proposed legislation in a fairly satisfactory manner. The net result was no legislation.

Unemployment Insurance.—This bill provided for a tax of 5 per cent. on all pay-rolls. Its seriousness speaks for itself and your representatives aided in preventing its passage.

Laudable as all these accomplishments may be, when viewed from the association's point of view, we can not forbear drawing attention to the fact that they are not appraised according to their value to the public, whose interests a "free and independent" press is supposed to protect, but according to their effectiveness in conserving the private interests of publishers. Defeat of the Tugwell bill is rated as a great achievement because its passage "would have been a serious blow to all advertising," but not a word is said of the public's interest in truthful advertising, pure foods and drugs, and honest labeling, important gains which that bill sought to attain. That advertising should continue to develop its arts—and, if need be, to prostitute its skill and opportunities—without restraint is the only matter that concerns publishers, if these gentlemen's self-commendations be read aright.

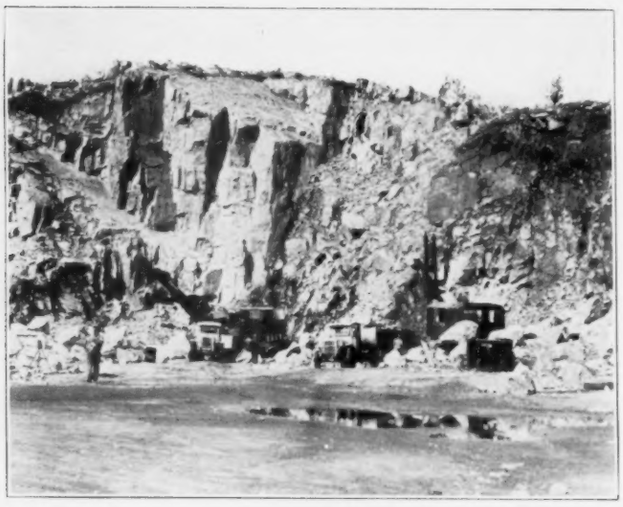
The Wagner bill and the proposals for unemployment insurance are to be considered purely from the standpoint of the publisher as additional burdens, according to the association's letter, for no mention is made of the social consequences of labor controversies or of the ultimate cost—even to publishers themselves—of the rising wages that result inevitably from a rising unemployment curve.

Too many members of the press, we regret to say, are Janus-faced, turning the one of benign altruism toward their readers and the one of determined self-interest toward those who may earnestly and honestly seek to advance the general good. It is for this and similar reasons that we can arouse within ourselves so little enthusiasm for a theoretical "freedom of the press," while so many powerful organs, although trying to make a virtue of their independence, courage and concern for the public, continue to follow the path of self-aggrandizement even when this crosses and obliterates that of public welfare.

Quartzite Granules Ma
High-Efficiency Mi

Part of Equipment Spec
to Meet Unusually Diffi

By W. E. TRAU



Quartzite quarry of Minnesota Mining & Mfg. Co. on Rib Hill with two shovels loading trucks.

AMONG the many nonmetallic-mineral plants built each year there are always a few which represent important advances in production and engineering practice and contribute more than their share to progress in these industries. Such a plant is the one recently completed by the Minnesota Mining & Manufacturing Co. of St. Paul, Minn., at Wausau, Wis., primarily for the production of roofing granules. This product is one of minor importance both in volume and value of annual production among the many nonmetallic-mineral products in this field but the design of this plant and its equipment merits study by producers in any other industries which involve handling and processing operations.

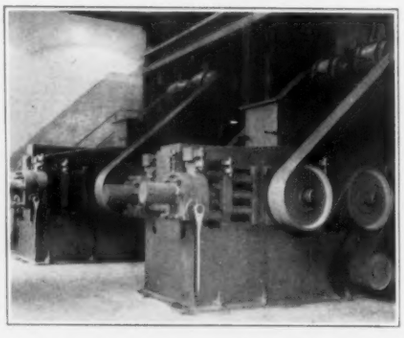
This plant was designed to reduce an extremely hard and abrasive quartzite from quarry size to an accurately-graded roofing granule of from 35-mesh to 10-mesh size at the rate of 20 tons per hr. Although the plant has only been in operation since September 1 it has already demonstrated the soundness of its design and the engineering practice involved as well as its ability to produce considerably more than the designed capacity. The finished roofing granules are colored by a patented process and are marketed under the trade name of "Colorquartz."

The history of operations at this deposit and plant location is also of interest. In December, 1929, the Minnesota Mining and Mfg. Co. took over a crushing and rough-screening plant near the present location but disposed of this in October, 1930. Some of the old crushing equipment was brought to the present plant site and was used to experiment with the quartz found in this locality. In the winter of 1932 equipment for the production of color quartz was installed. In the next winter the primary crushing and drying equipment for the new plant was installed. Further installations which were completed September 1, 1934, include a complete additional color-quartz plant and a fine-crushing and screening plant. A machine shop, storeroom and office are yet to be added.

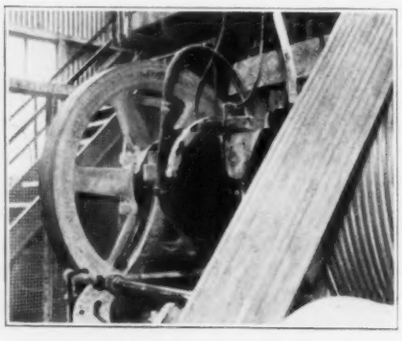
The quartzite deposit from which raw material for the plant is obtained is located on Rib Hill, about 5½ mi. by road from the plant. Rib Hill is the highest point in Wisconsin and any of the adjoining states, and a portion of it is included in the Rib Hill State Park which is one of the scenic areas of that section. According to the United States Geologic Survey the hill has an elevation of 1,940 ft. above sea-level while the elevation of the surrounding plain is only 1,200 ft. The location of the quarry is such that little injury is being done to the scenic appearance of the hill.

According to theories advanced by well-known geologists, the deposit consists of an altered sandstone which has been tipped up into a vertical position and strikes easterly along the ridge of the hill. The rock was at one time broken up on systems of fractures along which are found some discolored rock known locally as "red horse." The surface of the deposit is weathered to a friable rock resembling sandstone but this

The 4-ft. secondary gyratory crusher shown receiving material discharged from primary crusher.



Primary roll-crusher at left and one of the two secondary roll-crushers at right.

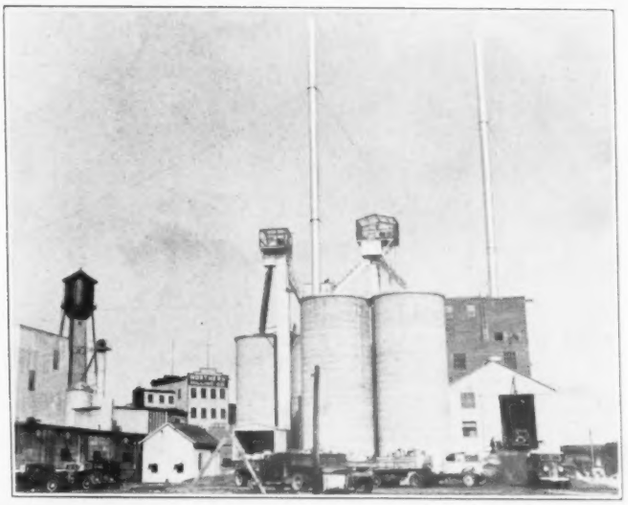


The 36-in. by 48-in. jaw primary crusher with electric motor and multiple V-belt drive at right.

Manufactured in New Minnesota Plant

Specially Designed Difficult Conditions

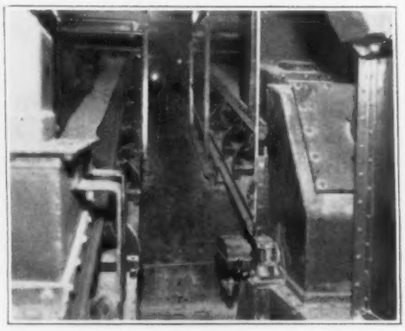
E. TRAUFFER



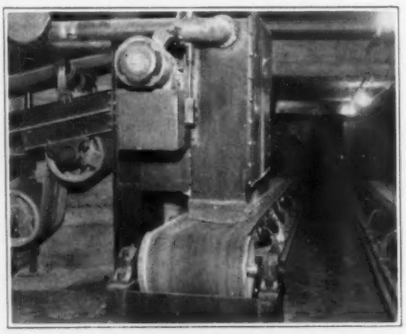
The new plant of the Minnesota Mining & Mfg. Co. with part of older plant at left.

extends only a few feet. None of these impurities are present in sufficient quantities to affect operations seriously. The pure quartzite has a white-to-grayish color and is a completely-recrystallized coarsely-granular rock resembling granular rock salt.

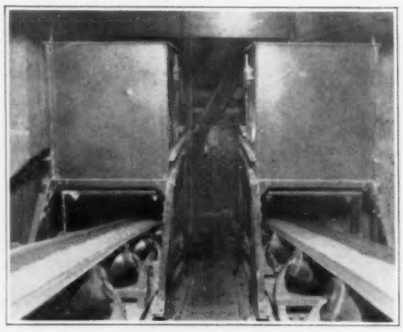
The quarry which is being opened near the top of Rib Hill has a face of about 90 ft., but a maximum of about 105 ft. will be attained later. Little stripping is now necessary but the overburden is heavier in sections as yet undeveloped. Coyote tunnel blasting is being employed, the tunnels being driven with drifter drills and the explosives detonated with electric blasting caps. On September 13 a blast was set off with a 40-ft. main tunnel and 50-ft. cross-cuts in the form of a double T. About 4,025 lb. of Atlas No. 1 dynamite of 40-per cent. strength rating was used. An estimated total of 20,130 tons of stone was loosed. Some secondary drilling is required and this is done with jackhammers for which air is supplied by a Chicago Pneumatic portable gasoline-driven air-compressor.



Raw-material conveyor at right with magnetic head pulley. Finished-granule conveyor at left.



Raw-material conveyor from storage discharging to magnetic separating conveyor.

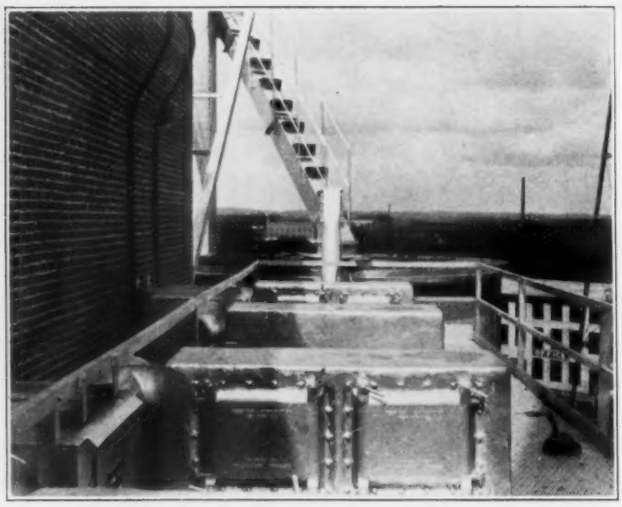


Weighing devices on raw- and finished-granule conveyors which are also shown in the two illustrations above.

Loading is being done by a Marion 460 Diesel-electric shovel and a P&H 1¼-cu.yd. gasoline shovel. After the quarry has been thoroughly developed only one shovel will be required for loading and the P&H unit will be used for stripping. Nine motor trucks are used to haul the stone to the plant, a run of about 5½ mi. More than a mile of this distance is traveled over a private road constructed on the company's property. The machines used include 4 new Diamond T 10-ton tractors, a Mack 13-ton tractor, a Sterling 13-ton tractor and 4 Sterling 8-ton trucks.

As the trucks come from the quarry they are first weighed on a 20-ton Fairbanks truck-scale and are then backed up an earth-fill ramp from which they dump directly into the 36-in. by 48-in. Traylor primary jaw crusher. This machine is set to produce 5-in. minus material and discharges through a chute into the Traylor 4-ft. Type TZ gyratory crusher on the floor below. This is set to produce 1-in. minus material and discharges through a chute to a bucket-elevator which has a stone-box at its head. An overflow chute from this box keeps the stone at a constant level to insure an even feed. A belt-feeder discharges the material into the 7-ft. by 45-ft. Bartlett & Snow direct-heat parallel-flow rotary drier.

A gate in the chute from the gyratory crusher is provided to allow by-passing the drier when desired. When this is done the chute discharges on a 24-in. belt-conveyor. This conveyor and the drier discharge into a bucket-elevator which supplies either of two 20-ft.-diameter by 55-ft. concrete storage-silos. The dry raw material is recovered from these silos through special hand-operated arc gates which feed a 24-in. belt-conveyor (No. 1) operating in a concrete tunnel. The material is then discharged on a second 24-in. belt-conveyor (No. 3) operating at right angles to the first and inclining downward toward its discharge end. This conveyor is equipped with a Magnetic Manufacturing

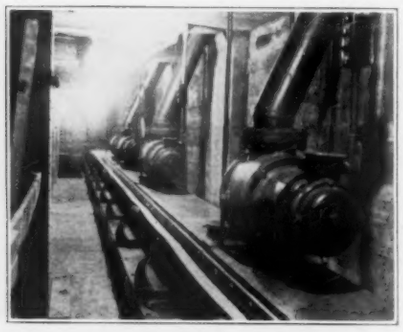


The top of the main electric precipitator which collects dust from the roll-crusher and screen building. The waste-material silo in background.

Co. Stearns high-intensity magnetic head-pulley which removes any metal present in the material. Near the discharge end of the conveyor is a Merrick Weightometer which records the amount and rate of feed of raw material to the fine-crushing and screening plant. A Merrick Weightometer Tonnage Rateograph in the main control room records continuously the rate of flow of the material.

This conveyor discharges into the No. 1 bucket-elevator which supplies the No. 1 Orville Simpson Rotex 5-ft. by 8-ft. single-deck scalping screen fitted with $\frac{5}{16}$-in. opening wire cloth. The oversize is discharged into a 110-ton steel surge-bin. A special belt-feeder delivers this material at any desired rate and in an even flow into the 54-in. by 14-in. Traylor 3M Wausau double-roll crusher. This is set to reduce it to $\frac{5}{16}$-in. minus and discharges to elevator No. 1 forming a closed circuit.

The material passing the No. 1 screen is discharged through a chute into bucket-elevator No. 2, from which it is dropped through a split chute on two 5-ft. by 8-ft. Rotex single-deck screens (No. 2 and 3) on the same floor as the scalping screen. These screens, which have .102-in. opening wire screen cloth, discharge their oversize into two 40-ton steel surge-bins. The material passing these two screens is spouted to four 40-in. by 120-in. Rotex double-deck screens (No. 4, 5, 6 and 7) on the floor below. These have .063-in. and .025-in. openings, respectively, on their upper and lower decks. Material retained on the top decks of these screens is also chuted to the two surge-bins previously mentioned. Belt-feeders transfer the material from these bins to the two 42-in. by 16-in. Traylor 3M Wausau double-roll finishing crushers which are set to reduce it to $\frac{1}{16}$-in. minus. Their product is discharged to elevator No. 2, forming another closed circuit.

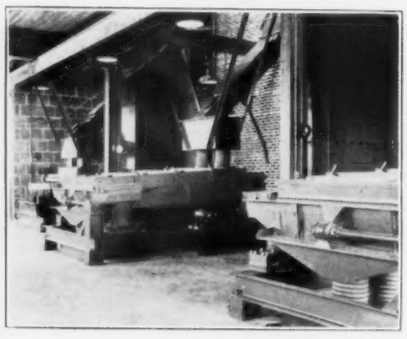


Dust from main electric precipitator being discharged to waste conveyor through rotary feeders.

The material retained on the lower decks of the four fine sizing screens is the 35-mesh to 10-mesh raw granules. It is discharged through chutes on a 24-in. belt-conveyor (No. 5), which carries it to a bucket-elevator from which the material is discharged through a split chute into two 20-ft. diameter by 55-ft. concrete silos for storage as finished sized raw granules. Another Merrick Weightometer weighs the finished raw granules as they pass over this conveyor. A Rateograph in the control room records the rate of production. The minus 35-mesh material passing the lower decks of these screens is called waste and is discharged on a 24-in. belt-conveyor (No. 4). A bucket-elevator raises this material to a 20-ft.-diameter by 40-ft. concrete storage-silo. Most of this material is hauled away to a waste dump in trucks.

The main Research Corp. Cottrell electric-precipitator system in this plant is as simple, efficient and well-engineered as the processing side of the plant. With the exception of the drier it collects dust from each unit of equipment and each room where dust is created in the entire new crushing, grinding and screening plant. All the equipment in this part of the plant is under suction through the center surge-bin in the roll-crusher building. This suction, produced by a Buffalo No. 9 fan, draws dust from the rolls and screens through the chutes and elevators into this bin. From the bin the dust passes through a duct chamber with five pant-leg hoppers which settle out the coarser dust.

The four double-deck screens which do the final sizing of the granules.



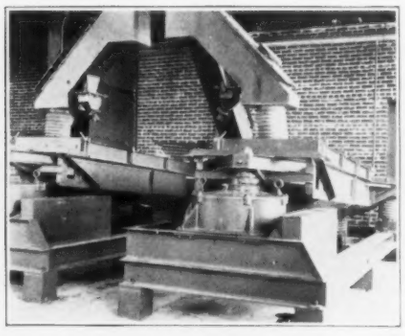
The three single-deck primary scalping screens with elevators from roll-crushers in background.

The air and fine dust are discharged into the Cottrell 2-unit precipitator which is located on the top of the building. This removes the fine dust from the air and discharges it, through motor-operated discharge valves, on the waste-material

belt-conveyor. The primary and secondary crushers have a separate pipe connection to a No. 5½ Buffalo fan which discharges into the main precipitator. The secondary-crusher room is also connected to this system.

This precipitator is of the horizontal-flow rod-curtain type and has 8 sets of rod curtains, each four of which are energized by separate 16-amp. electric sets. Tests show that the air flow to this precipitator is about 21,000 cu.ft. per min. and that the dust content varies from 11 to 17 grains per cu.ft. This air is at atmospheric temperature. The dust recovered by the precipitator varies between 99.4 and 99.7 per cent. of the total. A voltage of 45,000 to 75,000 is used and the power consumption is from 12 to 13 kw. Due to the type of construction, there also is very little back pressure against the fan.

In the breeching of the steel drier stack is a single-unit Cottrell electric-precipitator of the vertical upward-flow type. All the moist hot gases and the dust from the drier pass through this unit, which has steel box-type collecting plates with slots. The dust jarred loose from the plates drops through these slots and inside the plates unhampered by the air flow. This unit handles 8,500 cu.ft. of air per min. at a temperature of 300 deg. F. and with a dust content of 17.5 grains per cu.ft. Tests show that 99 per cent. of the dust is removed and the power consumed is only 5 kw. The collected dust drops on the raw-material conveyor running from the secondary crusher and eventually passes out into the main dust-collecting system. Further to insure protection of the employees from dust all the men working in departments where dust is created are required to wear Willson bag-type respirators furnished by the company.



Another view of two of the finishing screens showing feed chutes above.

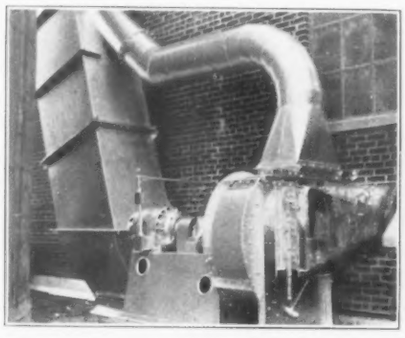
Drive end primary scalping screen with the two secondary scalping screens in background.

The electrical-control system used in this plant is also worthy of description as it eliminates all possibility of damaging or clogging any equipment in case of a breakdown. The danger of injury to the employees is also reduced. When starting the plant the master switch is first closed and the equipment units started up individually in counterflow to the flow of material through the plant. The only exceptions to this automatic sequence are the crushing rolls and their feeders. The feeders can be started separately only when all the other equipment following them in the flow is in operation, and they stop automatically when the equipment preceding them stops. Emergency push-button switches on each floor can stop the entire plant immediately. Ordinarily the plant is shut down by opening the master switch, which automatically stops the units in the order of the flow and requires 1 min. and 45 sec. to stop the entire plant.

Storage-silos and elevator for finished raw granules with drier stack at left. Note enlarged elevator stone-box and chutes doubling as stairs.

The Traylor roll-crushers are equipped with Timken roller bearings and have springs on both rolls and are the first of this size with these features to be made by the Traylor company. The rolls run at about double the usual speed for rolls of this size, the 42-in. rolls running at 325 r.p.m. and the 54-in. rolls at 185 r.p.m. In order to prevent ridging of the rolls due to the abrasiveness of the quartzite the drive pulley of one roll is slightly larger in diameter than the other giving the rolls a differential speed of 1½ per cent., thus keeping the rolls smooth by the grinding effect produced.

The belt feeders supplying material to these rolls were built to order and are designed to furnish a steady stream of even depth to them. These feeders are similar to ordinary belt feeders except that instead of having stationary skirts a vertical skirt belt is used on each side. These belts run on vertical

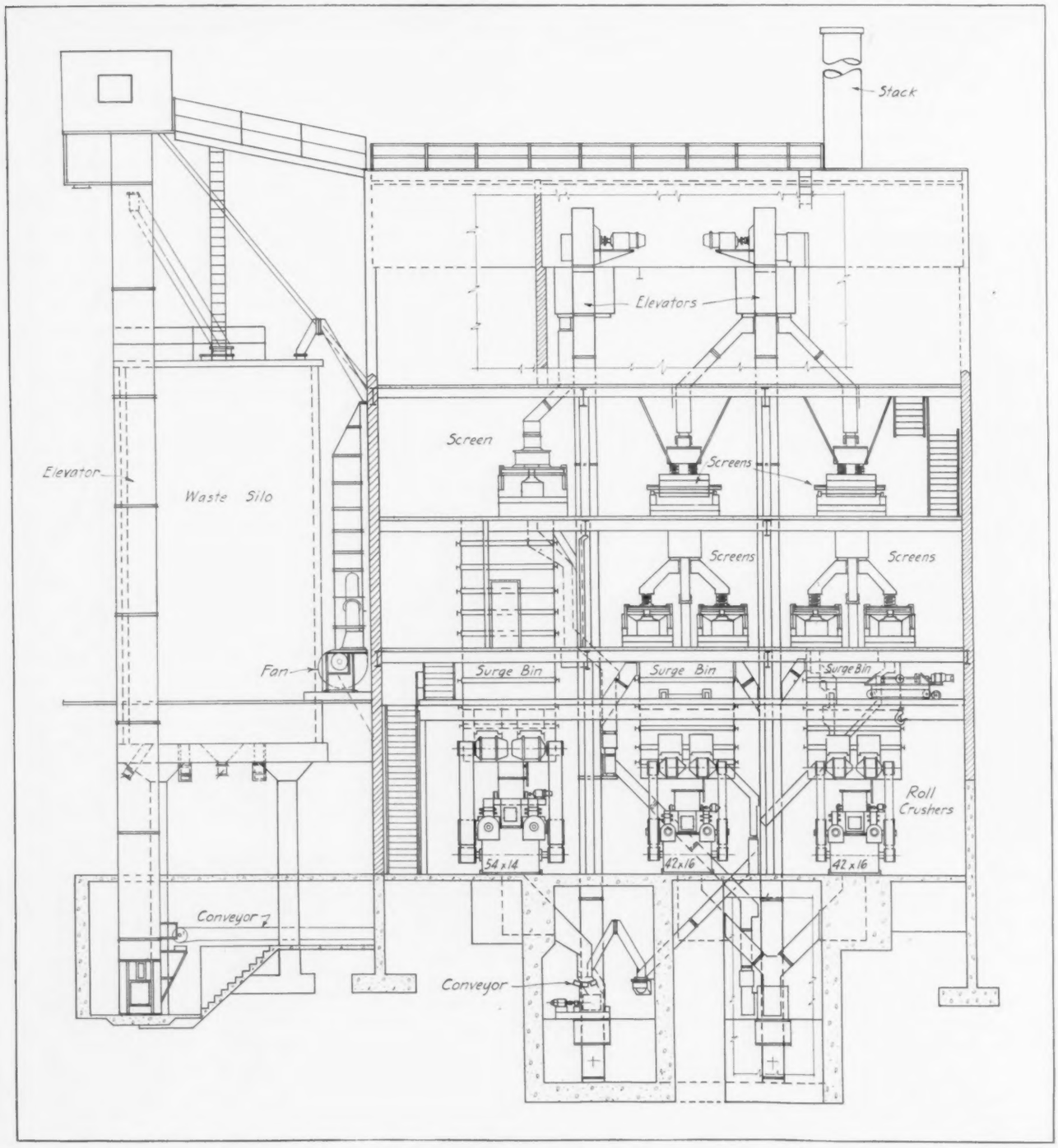


Fan which draws dust from primary and secondary crushers to main precipitator unit.

idlers and are kept in line and tightly sealed against the feeder belt by grooved pulleys whose weight holds them down. Wear on either the feeder belt or the skirt belts is eliminated by the fact that the latter are driven through contact with the former. Absolute speed control of these three feeders is obtained through the use of d.-c. motors and Ward-Leonard control. The same type of control is also used on the drier motor.

The bucket-elevators used throughout the plant also have specially-designed steel housings with exceptionally large stone-boxes at the top to receive the elevator discharge and convert it to a steady flow. All the steel chutes used in the plant are also provided with stone-boxes at frequent intervals. The elevators, chutes and other units are provided with inspection openings sealed with flexible rubber dust covers supplied by the Orville Simpson Co. and similar to the ones used on its inclosed screens. These insure against dust leakage or loss of suction, yet are easy to remove and replace. Each chute also has a sampling gate so that the feed to and from the rolls can be regularly analyzed and any breaks in the screen cloth detected.

Another feature is the method used to record the level in the three surge-bins and five silos. Pipes with special switches at intervals are placed vertically in these bins. These switches are contacted by



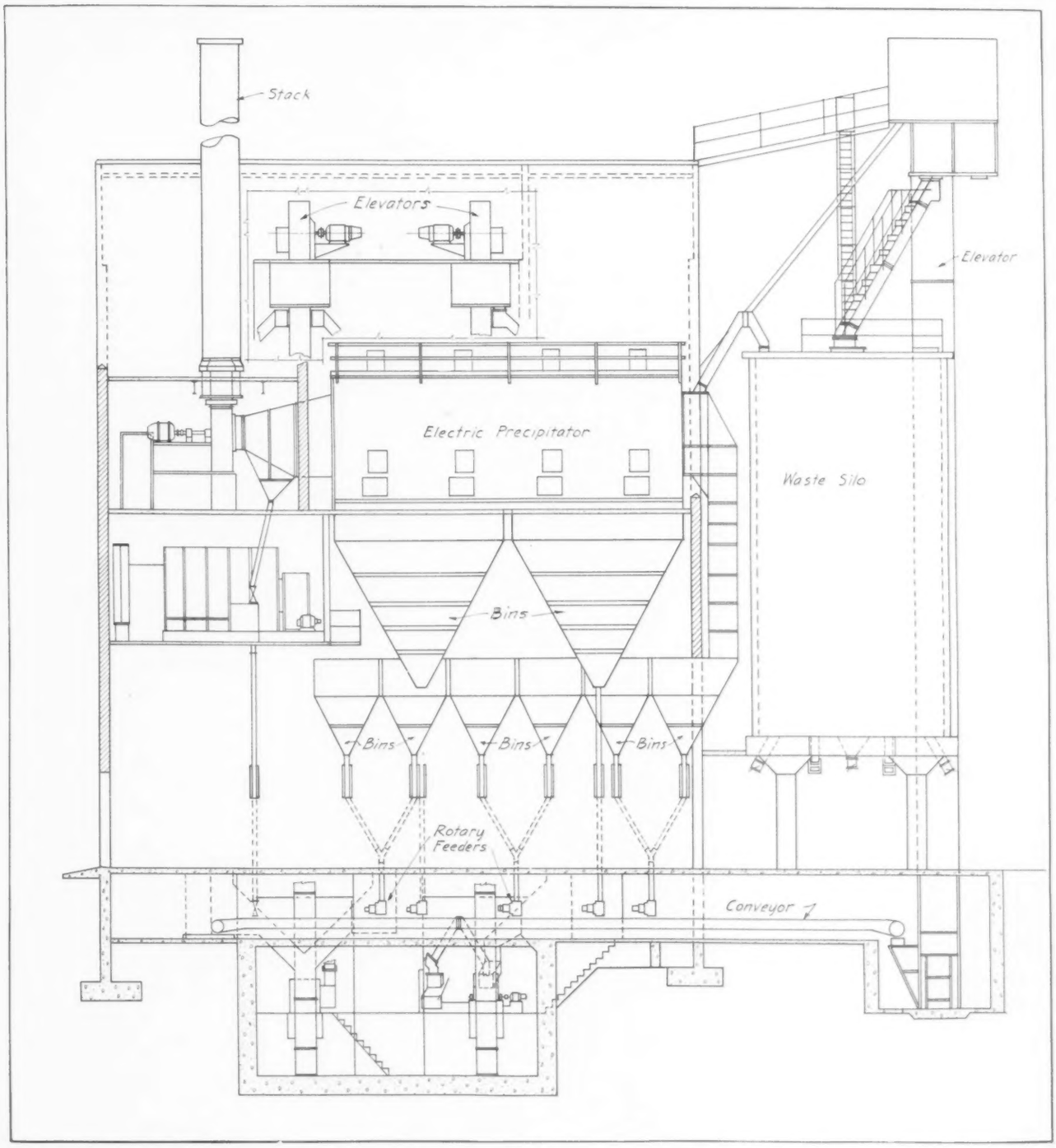
Elevation of the roll-crusher and screening building showing from top to bottom the primary and secondary scalping screens, the finishing screens and the primary and secondary roll-crushers.

the pressure of the material on them and flash lights on the main control-board, indicating at a glance the level of the material. A red light flashes when they are full.

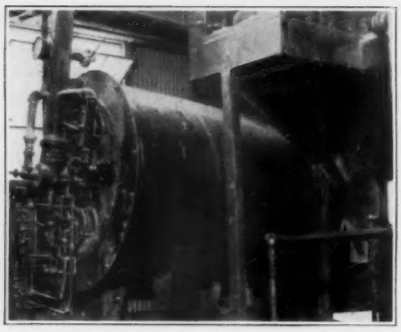
All the motors used in this plant have special dust seals and other equipment is similarly protected against abrasive dust. Air for the oil-burners firing the kiln and drier is furnished by G.E. rotary compressors. A fresh-air fan will be installed to heat the new plant in cold weather from steam coils supplied by a boiler at the old plant.

All the new plant structures are of permanent fireproof construction. The crushing-and-screening building has a structural-steel framework with brick curtain walls. Conveyor tunnels, crusher and elevator pits, floors, stairs, foundations, etc., are of reinforced-concrete construction. Steel-sash windows and fireproof steel doors are used throughout. The older buildings housing the color plant are also being modernized. The old sloping wood-frame roof is now being replaced with a modern flat concrete slab.

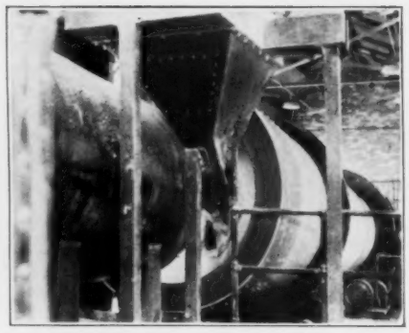
The Traylor Engineering & Manufacturing Co. furnished the primary and secondary crushers and the three double rolls for this plant. The seven Rotex screens and the rubber dust caps used throughout the plant were supplied by the Orville Simpson Co. The drier in the raw plant, the kiln



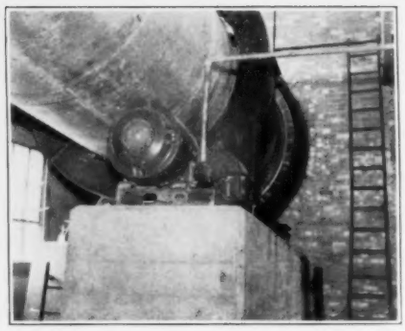
Elevation showing the main electric precipitator and its connection to the screens, crushers, elevators and bins in the roll-crusher and screening building. Dust discharge to waste material conveyor shown below.



Firing end of drier with oil-burning equipment, belt-feeder from elevator.



Rotary drier from firing end with belt-feeder above and drive at right.



Motor and reducer drive of drier. Dust collector in stock breeching.

and cooler in the color plant, and all the belt-bucket-elevators were supplied by the C. O. Bartlett & Snow Co. The Chain Belt Co. supplied the Rex Stearns Timken-bearing conveyor idlers and pulleys, and all the conveyor and elevator belting was made by the United States Rubber Co. The General Electric Co. supplied all the electric motors and gearmotors, most of the electrical instruments and equipment, two centrifugal compressors and two electric-arc welders. Timken roller-bearings are used on all the equipment except the jaw and gyratory crushers. Tyler square-mesh steel-wire cloth is used on all screens. A 20-ton Whiting over-head traveling crane spans the roll-crusher room.

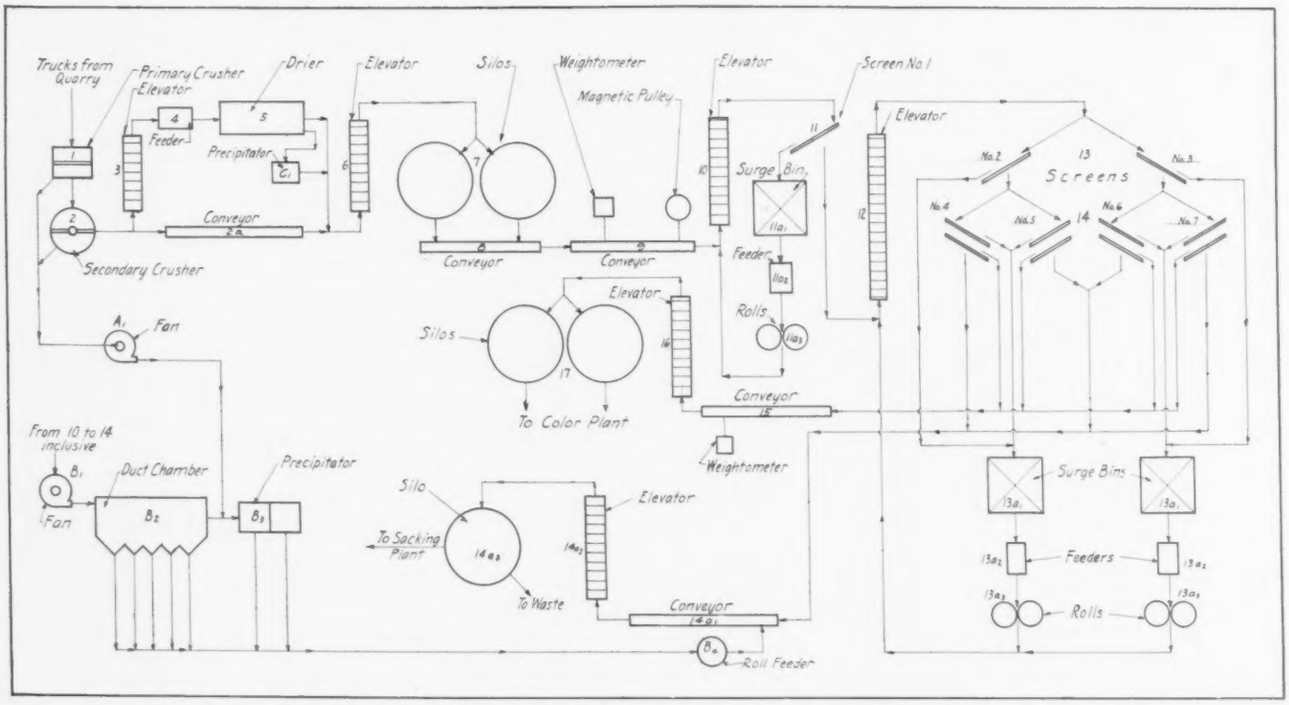
In keeping with the thoroughness of the Minnesota Mining & Mfg. Co. in its operations its relations with its employees and its provisions for their safety and welfare are noteworthy. Among the measures in use for years by this company are group insurance, a pension plan, a credit union, and unemployment insurance.

The group insurance in force allows all employees of over 90 days' standing to purchase, without medical examination, a $1,000 life-insurance policy, one-half of the premium for which is carried by the company.

Under the pension plan all employees make a small weekly or monthly deposit in proportion to their incomes and an equal amount is deposited by the company with a large insurance company. When the age limit of retirement is reached, the accumulated deposits guarantee a monthly income for life in proportion to the income and length of service of the employee. Should an employee leave the service of the company, all his own deposits are returned to him with 4-per cent. compound interest.

The unemployment-benefit plan which had been in force for years has been superseded at the Wausau plant by the Standard Voluntary Unemployment Benefit Plan recently authorized by the Wisconsin Industrial Commission.

The Minnesota Mining & Manufacturing Co. produces a widely-diversified line of products. Besides making "Colorquartz," it is the largest manufacturer in the world of coated abrasives and is the inventor of "Wetordry," the original water-

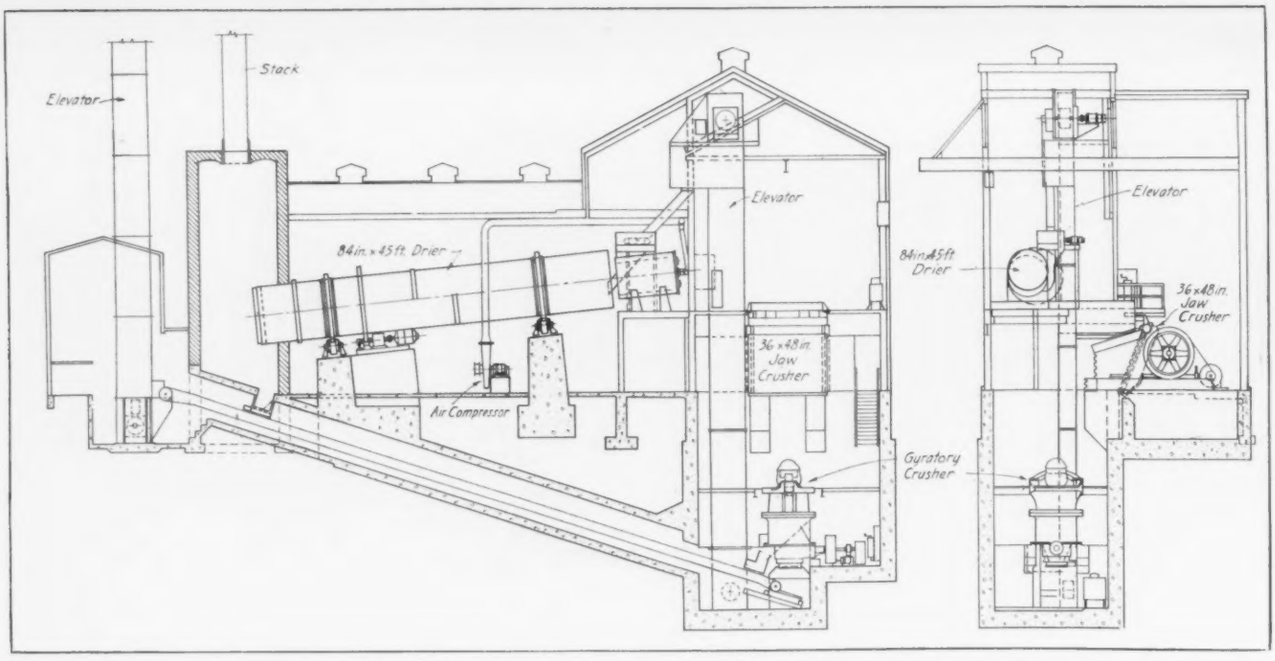


Flow-sheet of the roofing-granule plant of the Minnesota Mining and Manufacturing Co. at Wausau, Wis.

TABULAR ANALYSIS OF THE OPERATIONS AND EQUIPMENT OF THE MINNESOTA MINING & MANUFACTURING CO., WAUSAU, WIS.

(Key Numbers refer to corresponding numbers on accompanying flow-sheet.)

Operation	Key	Equipment	Make	Model No., Size, Capacity or Type	Power Source	Power Transmission
Primary and secondary crushing	1	Crusher	Traylor	36-in. by 48-in. jaw	G. E. 100-hp. motor	Texrope drive
	2	Crusher (To 3 or 2a)	Traylor	4-ft. Type TZ gyratory	G. E. 75-hp. motor	Rockwood flat-belt drive
Drying	3	Elevator	Bartlett & Snow	Belt, 15-in., 62½-ft. ctr., 14-in. by 8-in. buck. Belt type	G. E. 10-hp. gear-motor	Direct-connected
	4	Feeder				
	5	Drier (To 6)	Bartlett & Snow	7-ft. by 45-ft. rotary parallel flow	G. E. 20-hp. d.c. motor, Ward-Leonard drive	D. O. James speed-reducer
Drier by-pass	2a	(From 2) Conveyor Belt (To 6)	Rex Stearns U. S. Rubber Co.	Belt, 24-in., 86-ft. centers	G. E. 5-hp. gear-motor	Direct
Dried raw-material storage	6	Elevator	Bartlett & Snow	Belt, 15-in., 100 ft. centers, 14-in. by 8-in. buckets	G. E. 10-hp. gear-motor	Direct-connected
	7	Silos (2)		Concrete, 20-ft.-diam. by 55 ft.		
Handling, magnetic separation and weighing	8	Conveyor No. 1 Belt	Rex Stearns U. S. Rubber Co.	Belt, 24-in., 70-ft. centers	G. E. 2-hp. d.-c. gear-motor, Ward-Leonard drive	Direct
	9	Conveyor No. 3 Belt	Rex Stearns U. S. Rubber Co.	Belt, 24-in., 60-ft. ctr.	G. E. 1½-hp. gear-motor	Direct
		Magnetic pulley	Magnetic Mfg. Co.	Stearns high-intensity		
		Weightometer	Merrick			
First scalping	10	Elevator No. 1	Bartlett & Snow	Belt 15-in., 92½-ft. ctr., 14 in. by 8-in. buck.	G. E. 20-hp. gear-motor	Direct-connected
	11	Screen No. 1 (Coarse to 11a1, fines to 12)	Orville Simpson	Rotex, 5-ft. by 8-ft. single-deck	G. E. 5-hp. squirrel-cage motor	Texrope drive
First recrushing	11a1	Bin		Steel surge, 110-ton		
	11a2	Feeder		Belt	G. E. 2-hp. d.-c. gear-motor, Ward-Leonard drive	
	11a3	Rolls (To 10)	Traylor	54-in. by 14-in. double-roll Wausau 3M	G. E. 30-hp. fan-cooled motors (2)	Houghton "Vimtread" flat belt
Secondary scalping	12	Elevator No. 2	Bartlett & Snow	Belt, 15-in., 92½-ft. ctr., 14-in. by 8-in. buck.	G. E. 20-hp. gear-motor	Direct-connected
	13	Screens (2) No. 2 and 3 (Oversize to 13a1, fines to 14)	Orville Simpson	Rotex, 5-ft. by 8-ft., single-deck	G. E. 5-hp. squirrel-cage motors (2)	Texrope drives
Final recrushing		(From 13 and 14)				
	13a1	Bins (2)		Steel surge, 40-ton each		
	13a2	Feeders (2)		Belt	G. E. 2-hp. d. c. gear-motors, (2), Ward-Leonard drive	
	13a3	Rolls (2) (To 12)	Traylor	42-in. by 16-in. double-roll Wausau 3M	G. E. 15-hp. totally-inclosed, non-ventilated motors (4)	Houghton "Vimtread" flat belt
Finish screening	14	(From 13) Screens (4) No. 4, 5, 6 and 7 (Oversize to 13a1, intermediate size to 15, fines to 14a1)	Orville Simpson	Rotex, 40-in. by 120-in., double-deck	G. E. 5-hp. squirrel-cage motors (4)	Texrope drives
Handling, weighing and storage of finished raw granules	15	(From 14) Conveyor No. 5 Belt	Rex Stearns U. S. Rubber Co.	Belt, 24-in., 125-ft. ctr.	G. E. 1½-hp. gear-motor	
		Weightometer	Merrick			
	16	Elevator	Bartlett & Snow	Belt, 15-in., 92-ft. centers, 14-in. by 8-in. buckets	G. E. 10-hp. gear-motor	Direct-connected
	17	Silos (2) (To color plant)		Concrete, 20-ft.-diam. by 55 ft.		
Waste material handling and storage		(Fines from 14, dust from B2 and B3)				
	14a1	Conveyor No. 4 Belt	Rex Stearns U. S. Rubber Co.	Belt, 24-in., 80-ft. centers	G. E. 1½-hp. gear-motor	Direct-connected
	14a2	Elevator	Bartlett & Snow	Belt, 15-in., 100-ft. ctr., 14-in. by 8-in. buck.	G. E. 20-hp. gear-motor	Direct-connected
	14a3	Silo (To sacking plant or to trucks for waste.)		Concrete, 20-ft. diam. by 40 ft.		
Dust collection from primary and secondary crushers	A1	(From 1 and 2) Fan (To B3)	Buffalo	No. 5½ centrifugal	G. E. 25-hp.	Direct-connected
Dust collection from rolls and screens		(From 10, 11, 12, 13, 14; 11a1, 11a2, 11a3; 13a1, 13a2, 13a3)				
	B1	Fan	Buffalo	No. 9 centrifugal	G. E. 50-hp. motor	Direct-connected
	B2	Duct chamber (Coarse dust to 14a2; fine dust to B4) (From B2 and A1)		3-hopper		
	B3	Precipitator	Cottrell	2-unit electric horizontal-flow, rod-curtain type		
	B4	Feeders (4) (To 14a1)		Roll type	G. E. ¾-hp. gear-motors (4)	Direct-connected
Dust collection from drier	C1	(From 5) Precipitator (To 6)	Cottrell	1-unit electric, vertical upward flow		



Elevation showing primary and secondary crushers at right. Elevator and feeder to drier are shown together with conveyor by-passing drier. Stack brucking at left houses an electric precipitator.

proof sandpaper. In addition to its line of abrasive-coated paper and cloth it produces "Scotch" masking tape and, under the trade name "Scotch," drafting tape, electrical tapes, photographic tape, fiber shoe tapes, cellulose tape, sand-blast stencil and sand-blast filler. The company also manufactures tan fiber packing, tan fiber shoe covering and a complete line of automobile polishes under the trade name "Retsul."

The majority of its products are protected by patents. "It has always been the aim of the company to serve the needs of modern industry by meeting the existing requirement for some product as yet unattained and not to manufacture a product just for the sake of selling it," according to one of the company's executives.

Quarry after blast viewed from same point as illustration at left below.

Mine and Quarry Accidents

An analysis of reports covering 50,574 lost-time temporary injuries at mines and quarries entered in the National Safety Competition of the U. S. Bureau of Mines shows that the average injury disabled the employee 21 days. Eighteen days was the average period of 5,353 accidents to men injured in quarries and open-cut mines. The figure for anthracite mines was also 18 days, for metal mines 20 days, for other nonmetallic mines 21 days.

Quarry before blast with coyote tunnel in center background. Shovel loading truck in foreground.

View of top of blast clearly indicating that bottom was "kicked out" and top dropped down.

Quarry at No. 4 plant with incline in foreground and cableway to No. 5 plant in left background.

Typical cableway crossing well-traveled highway and eliminating danger to traffic by protecting net.

Difficult Rock-Transportation Problem Solved by Use of Two Cableways

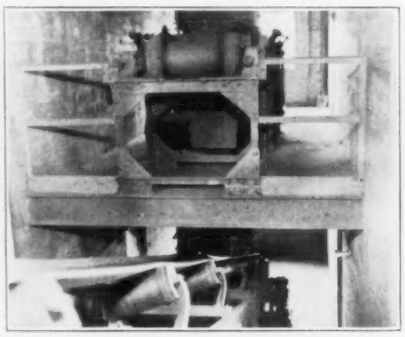
Preliminary Blending of Cement Rock Is Accomplished at Transfer Station

THE use of cable tramways for handling materials is widespread in the nonmetallic-minerals industries, particularly where the material is to be hauled a considerable distance over rough or hilly country. An interesting installation is the one operated by the Pennsylvania-Dixie Cement Corp., at Nazareth, Pa. While the terrain there is only slightly rolling, the number of highways and railroads to be crossed made it impractical to haul by railway or motor truck.

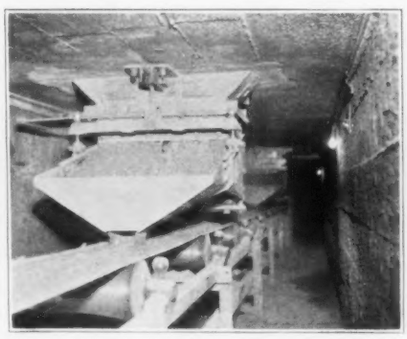
In and near Nazareth the company has three plants known as plants No. 4, 5 and 6. Each of these originally had its own quarry, the No. 4 quarry being particularly good as the stone is almost perfect cement rock and it has never been necessary to buy other stone. Late in 1927 it was decided to abandon plant No. 5 quarry for economical reasons and haul rock from No. 4 quarry. A 10,162-ft. American Steel & Wire Co. tramway of 150-tons-per-hr. capacity was put in operation late in August, 1928, for this purpose. This tramway was operated steadily until July, 1929, when plant No. 5 was shut down as only two plants were required to supply the existing demand.

Plants No. 4 and 6 were then operated for some time using stone from their own quarries, but the operation of No. 6 quarry was becoming more and more expensive due to the increasingly-heavy overburden which was being encountered. As a result it was decided to build a new tramway from plant No. 5 to No. 6 and to use No. 5 merely as a transfer station. The new American Steel & Wire Co. tramway, which began operating March 15, 1934, is 5,150 ft. long and has a capacity of 250 tons per hr. No changes were made in the old tramway except the relocation of the loading station at the dispatching station.

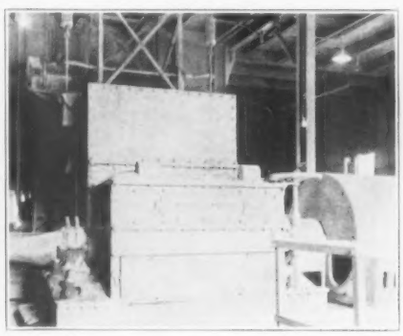
In the quarry at plant No. 4 the rock is loaded



Belt feeder under tramway silo at plant No. 6. Belt to plant storage below.



Electric vibrating feeders discharging blended stone from storage to No. 6 plant.



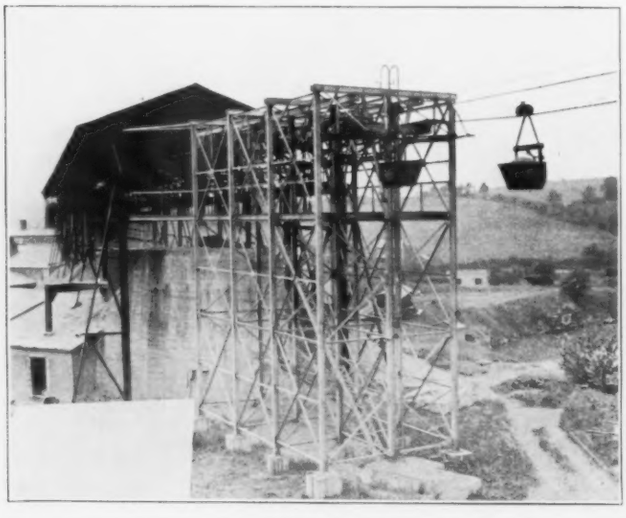
Scalping screen which discharges oversize to hammer-mill for secondary reduction.

into cars which are hauled up an incline to the plant by cable and hoist. Their contents are discharged into the 36-in. by 60-in. Allis-Chalmers Fairmount single-roll crusher, the product of which is taken by a bucket-elevator to a 5-ft. by 12-ft. single-deck Allis-Chalmers vibrating screen fitted with screen cloth having 1½-in. and 1-in. openings. The material retained on the top deck of this screen is discharged direct into the Pennsylvania SXT 13 hammer-mill which is driven by a 400-hp. synchronous motor at 720 r.p.m.

The rock from the quarry contains some clay, which breaks up readily and passes the decks of the vibrating screen. The product of the crusher, therefore, has a lime content 4 to 5 per cent. higher than that of the stone passing the screen. The high- and low-lime products are discharged into separate steel-inclosed bucket-elevators which raise them to conveyors feeding the storage of plant No. 4. When stone is desired for plant No. 6, it is diverted at the heads of the elevators to a belt-conveyor which is 24 in. wide, operates on 125-ft. centers and discharges the stone into a reinforced-concrete storage silo of 500 tons' live capacity. When No. 4 quarry is shut down stone can be reclaimed from plant No. 4 storage to a bucket-elevator which feeds the conveyor running to the tramway silo. Only one kind of stone is handled by the tramway at one time, so when plant No. 4 gets high-lime stone the tramway gets low-lime stone and *vice versa*.

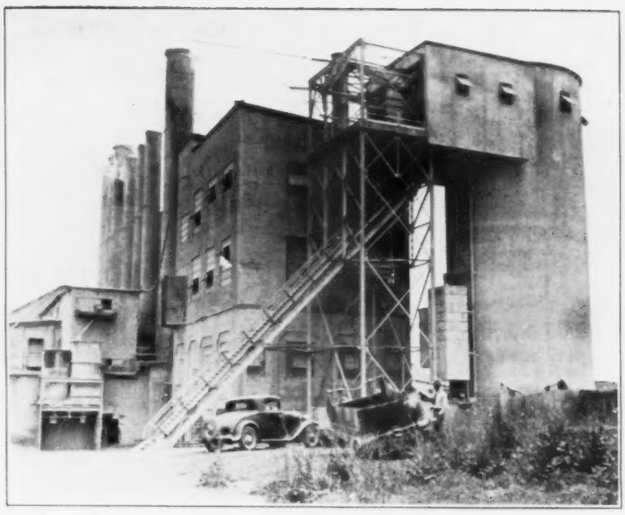
Apron feeder at upper right carries material from storage-bin at plant No. 5 to buckets on cableway going to plant No. 6.

Stone is loaded from this silo through six hand-operated gates into the buckets of tramway No. 1 connecting plants No. 4 and 5. This tramway is 10,162 ft. long and is of the Bleichert type with two stationary parallel track cables of Lock-coil construction supported on steel towers. These cables are anchored to concrete foundations at both terminals, and at the angle station, midway between the terminals, they are attached to counterweights which maintain the proper tension. The track cables support 1-ton bucket-carriers which move in a continuous circuit at intervals of 200 ft. A ⅝-in. Lang-lay traction cable moves the buckets at the rate of 500 ft. per min. The loaded track cable is 1½ in. and the empty cable is ⅞ in. in diameter. A 50-hp. G.E. slip-ring motor drives the traction cable through gears and a grip sheave, a 10,000-lb. reinforced-concrete counterweight maintaining proper tension.

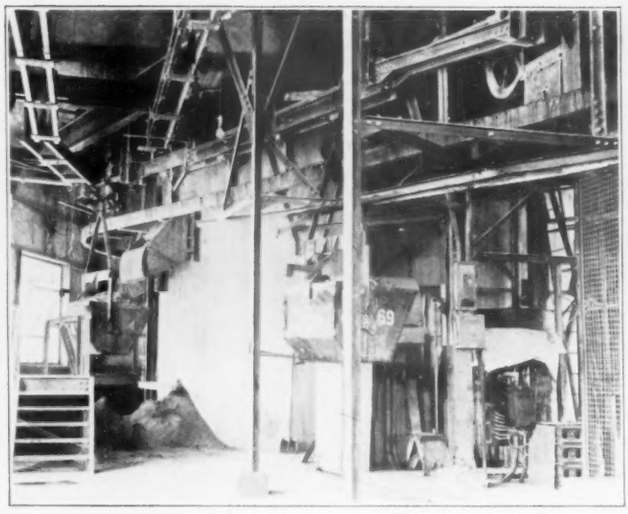


Terminus of cableway from plant No. 4. Stock-pile where rough blending is accomplished is at left.

View at plant No. 5 showing conveyor from storage at left discharging into bin feeding cableway to plant No. 6.



Discharge terminal of cableway at plant No. 6 with concrete silo into which stone is discharged.



Buckets being loaded for first cableway at plant No. 4. Buckets in foreground being dispatched automatically.

As the empty buckets approach the loading terminal they are automatically released from the traction rope and travel by gravity over double head rails to the loading chutes. After they are loaded they go by gravity to an automatic dispatcher. About midway between the terminals the tramway turns at an angle of 144 deg. and again close to the discharge terminal at an angle of 170 deg. This tramway crosses three public highways where protection is given to road traffic by suspended steel nets.

At the discharge terminal, which is 33 ft. higher than the loading terminal the buckets are dumped by means of 22 electric trippers controlled by push-buttons. The buckets are tripped while in motion, right themselves automatically and continue on the return trip. The open storage at plant No. 5 has a total capacity of 35,000 tons and a live capacity of 8,000 tons. By constantly changing the point of discharge a rough blending is accomplished. Stone is placed on a conveyor running in a concrete tunnel under the storage by means of 17 arc-type adjustable reciprocating feeders which are operated by one motor through a long rod. A further blending is obtained through these gates.

The 24-in. tunnel belt-conveyor operates on 220-ft. centers and can discharge into an elevator leading to the drier-feed bin when plant No. 5 is operating. Ordinarily, however, the elevator discharges on a 24-in. inclined belt-conveyor which is set on 160-ft. centers and discharges into a 250-ton circular steel bin serving the new No. 2 cableway. A Jeffrey 30-in. apron feeder discharges the material from this bin into the cableway buckets which have a capacity of 38 cu.ft., or about 3,800 lb., each. An automatic weighing device starts the feeder when a bucket arrives and stops it when the bucket is filled. These buckets are dispatched automatically at intervals of 228 ft. or 27.4 sec.

The new tramway is 5,150 ft. long from terminal to terminal and has a rise of 8 ft. in that distance. The loaded buckets are carried on 1¾-in. and the "empties" on 1-in. locked counterweighted cable. The traction rope is ¾-in. Lang-lay and is driven at a speed of 500 ft. per min. by a 30-hp. G.E. motor through a Falk speed-reducer which is direct-connected to the driving-cable drum. The motor is equipped with a G.E. Thrustor brake. Four highways and two railways are crossed by this tramway.

Tramway No. 2 discharges into a 1,000-ton concrete silo at plant No. 6. Stone is taken from this silo by two 30-in. belt feeders operating in tandem and is fed through a steel hopper to a 30-in. inclined belt-conveyor which operates on 215-ft. centers and is driven by a 30-hp. motor through a Bethlehem spur-gear reducer. The conveyor discharges into a double-strand 12-in. Bethlehem drag-chain conveyor which feeds six concrete silos of 600 tons' capacity each, arranged in two rows. A final blending of the raw stone is obtained by drawing it from these silos concurrently through three Jeffrey-Traylor 3-ft. by 3-ft. heavy-duty Type CV55 twin vibrating feeders. These discharge on a belt-conveyor which runs in a concrete tunnel and feeds plant No. 6. United States Rubber Co. conveyor belting is used throughout.

Output of Mica in 1934

The total quantity of unmanufactured mica (including sheet and scrap mica) produced in 1933 and sold or used during that year, was 8,933 short tons, valued at $151,338. Compared with 1932, these figures show an increase of 24 per cent. in quantity and 17 per cent. in value. This total consists of 364,540 lb. of uncut sheet (including punch mica), valued at $53,179, and 8,751 short tons of scrap mica, valued at $98,159. Of this total New Hampshire and North Carolina combined produced about 85 per cent. in quantity and 84 per cent. in value. The rest was produced in Colorado, Connecticut, Maine, New Mexico, South Carolina, South Dakota, and Virginia.

Ninety-one per cent. of the total commercial production of sheet mica (including punch mica) (364,-540 lb., valued at $53,179), was contributed by New Hampshire and North Carolina.

Aggregate Industry's Code Puts Business Transactions on Ethical Plane

Rebates, Contract Interference and Other Old Evils Are Banned

By W. W. GIBSON

Executive Secretary, Regional Committee No. 11 Crushed-Stone, Sand-and-Gravel and Slag Industry

EVERY now and then we hear someone say that the code is a complete failure and is of no value to them. These remarks are usually made by someone who has not carefully considered the intent and purpose of the code. The fact is that many people have become discouraged because they felt that the code was going to act as some kind of panacea for all their business ills, and did not consider for a moment that it is up to the individual to do his part to make it a success. The government never intended to act as a guarantor for business. It was always the intention that industry should govern itself and the codes were set up with that idea in mind. They are far from perfect, but no one could expect that such a big task could be accomplished without some mistakes.

Before the days of the codes, most live, aggressive business men belonged to some trade association. They attempted to get together and interchange ideas and experiences. These trade associations did a great deal of good, but when some member of the association violated his agreement or committed an unethical act, there was nothing much that could be done about it, and it usually ended by breaking up the association. Thereafter each member went on his way, competing against his rivals in cut-throat fashion until they were finally obliged to get together again. It was their only hope. Many of these trade associations reorganized time and time again with the same result.

Now, in addition to the good purposes for which these original trade associations were organized, the government stepped in and bolstered up these former weaknesses by adopting codes of fair competition which contain certain trade-practice provisions that, if properly enforced, are the foundation stones upon which good, sound business can be built. To-day, thanks to the codes, it is unlawful and punishable by suitable penalties to do many of the unethical things that were practiced every day before the codes were effective, such as the giving of secret rebates, contract interference, defamation of a competitor, misrepresentation, misbranding, commercial bribery, contingent selling, lump-sum bidding. All these are violations of the code of fair competition.

Many believe that the codes are not being properly enforced, and it is true in many instances. However, it must be admitted that the N.R.A. compliance boards are making an honest effort in this direction. There may be some instances where the terms of the code are ambiguous, or someone in authority may not properly interpret its meaning. For instance, in our own industry, we have had a great deal of difficulty about the filing of prices as far as contractor-producers are concerned. There should never have been any trouble about this. The code is very plain on this point, but apparently someone along the line has misinterpreted the provision covering the filing of prices. There are bound to be many instances of this kind where the administration of the provisions of the code is in the hands of more or less inexperienced directors, but there is no doubt that all these maladjustments and misinterpretations will be corrected with time and experience.

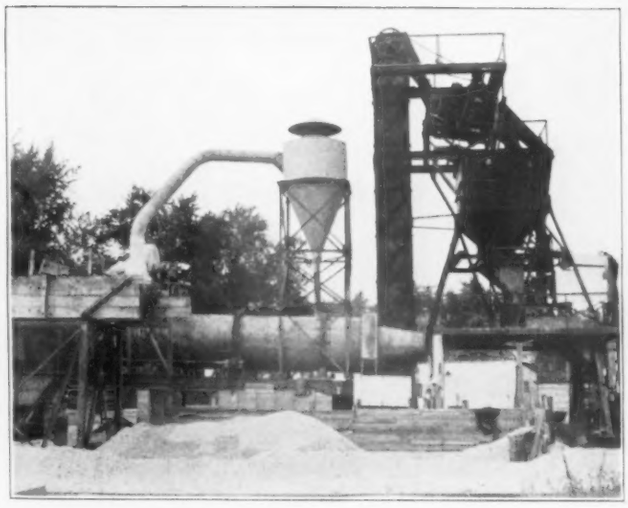
Some of the difficulties that we have had were due to the fact that producers in our industry took it for granted that highway departments and other government officials are acting in the capacity of enforcement officers. That was wrong. The duty of these officials is to require, where federal funds are used, that each producer submit with his bid a signed certificate of compliance, setting forth that he is complying and will continue to comply with the applicable code. Once this duty is performed by the government official, his responsibility is ended. If there are any violations or falsifications in the certification, then it is up to the producer to make the complaint to the proper authorities, and see that the offender is properly dealt with.

While it is not obligatory upon these government officials to coöperate in making the various codes a success, yet it is interesting to note that a great many of them are doing everything within their power to help while others are absolutely indifferent. For instance, in South Dakota the highway department now requires that the bidder give ample proof that he has filed his prices in accordance with the provisions of the code. This attitude has been very helpful in administering the code and has precluded the necessity of worrying about restraining orders and other legal action whenever a violation occurs. The pathway of the N.R.A. and industry generally would be much smoother if this same coöperation would be given by all officials of subdivisions of government.

The codes are here to stay. There will be some changes, and many improvements will be made, which will be very helpful to industry generally. Business, after all, is a competitive game, in which

(Continued on page 42)

Aggregate-bituminizing plant of Muskingum Valley Asphalt & Supply Co. at Zanesville, O.



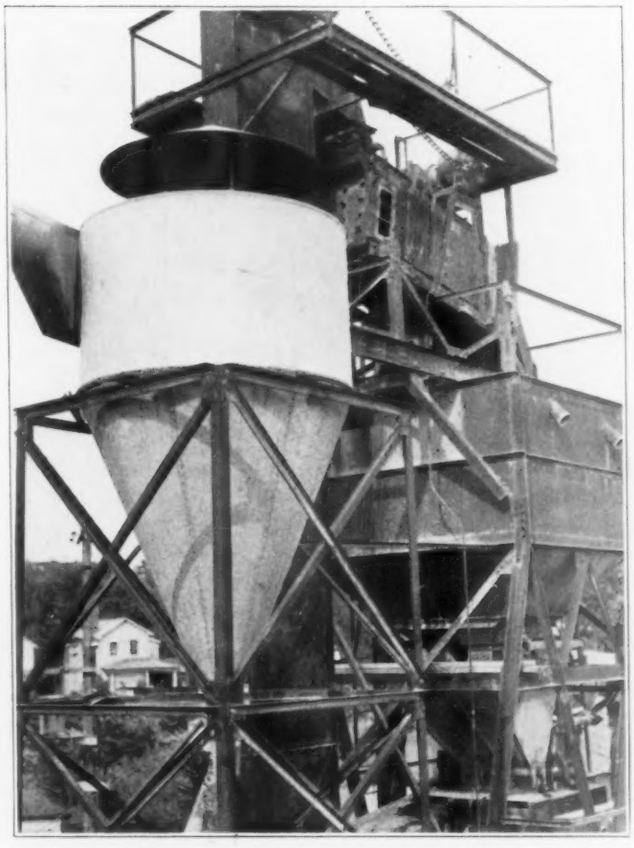
Another view of plant with aggregate hopper at left. Screen, batchers and mixers are at right.

Subsidiary of Sand-and-Gravel Producer Begins Bituminizing Aggregates

Operation of Plant Can Be Changed Over from Hot-Mixed to Cold-Mixed Material

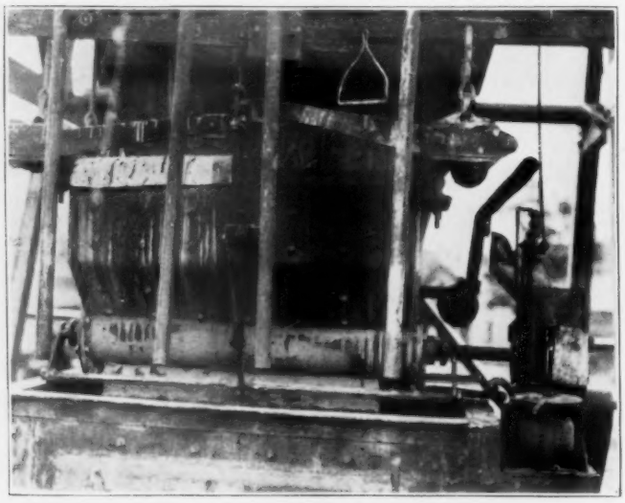
THE bituminizing of aggregates for highways is rapidly becoming the function of the aggregate producer rather than of the contractor or governmental body doing the actual road construction. The availability of the aggregates, the possession of a permanent plant site, and the steadier production possible with such an arrangement give the producer-owned plant a great advantage over others.

One of the latest plants of this type to be put into operation is that of the Muskingum Valley Asphalt & Supply Co., at Zanesville, O. This company is a subsidiary of the Marietta Concrete Corp., of Marietta, O., producer of sand and gravel and ready-mixed concrete. This plant, which went into operation June 19, 1934, was furnished complete by Hetherington & Berner, Inc., and has a capacity of about 40 tons per hr. It is located near the heart of the city. Although at present working on hot-mixed materials for local use, the plant can be quickly changed to produce cold-mixed material, thus being suitable for storage, trucking or car-load shipments. Material for state-highway work has also been produced, both T50 which is hot-mixed and hot-laid and T60 which is cold-mixed and cold-laid. Much of the production is used for patching and for the surfacing of new concrete-base construction. Gravel, crushed stone and sand are used for aggregates as specified. Most shipments are being made by trucks.



Cyclone connected to drier shown in two views at top of page. Elevator, screen, bin, batching equipment and mixer in background.

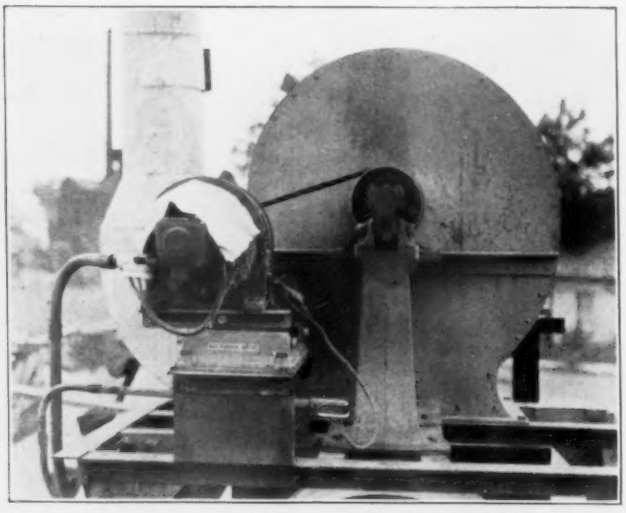
A Universal gasoline crane unloads aggregates from cars either to stock-piles or into a 3-compartment Blaw-Knox steel bin having a total capacity of 15 tons. These three compartments allow the mixing of sizes into the plant bucket-elevator.



Aggregate and bitumen batchers with mixer below and time-lock device at right.

This supplies the oil-fired rotary drier which discharges into an inclosed bucket-elevator feeding the 4-deck Deister Machine Co. Plat-O vibrating screen. The four sizes of material produced are chuted to a 4-compartment, 10-ton steel bin.

The aggregate is fed from the bin compartments to a 2,000-lb. weighing batcher equipped with beam scales, and the bitumen is weighed into a batcher equipped with a Fairbanks springless dial scale. The Hetherington & Berner 1-ton mixer is equipped with a time-lock device made by the same company.



Drier exhauster fan with flat-belt-drive motor mounted on gravity tension base.

Trucks are loaded under the mixer and, as a check, are weighed on a 15-ton Howe truck-scale at the plant office.

Bitumen is received in tank-cars and unloaded into a tank 10 ft. in diameter and 25 ft. long. A boiler supplies steam for heating this tank and an 8-ton kettle which is used for reheating and pumping. Fuel oil for the drier burner is stored in another large tank.

A Bayley exhauster fan creates draft for the drier and discharges into a cyclone that allows the hot air to escape but reclaims the dust, which is collected and wasted. This fan is driven by a 15-hp. G. E. motor through a Rockwood flat-belt drive. A 25-hp. Master gear-motor drives the drier through a shaft and gear and the first elevator is driven from this shaft by chain, the motor being connected to the shaft by a Link-Belt chain-type coupling. The shaft and drier-carrying rollers are fitted with SKF ball bearings. The vibrating screen is driven through Goodrich V-belt by a 10-hp. Master gear-motor which also drives the second elevator by chain. The mixer is chain-driven by a 50-hp. Master motor. Both bucket-elevators are of Link-Belt manufacture.

Accidents in Lime Plants

Accident records covering five years of operation of lime-manufacturing plants in the United States, together with the operation of the quarries associated with the lime kilns, reveal an accident-frequency rate of 61.7 per 1,000,000 man-hr. of exposure to risk and an estimated accident-severity rate of 5.2 per 1,000 man-hr. of exposure. The rates for quarrying at these plants, as distinguished from those for lime-burning, were 80.5 for frequency and 7.1 for severity; corresponding rates for lime-burning and other non-quarrying operations at the same plants were 47.9 for frequency and 3.7 for severity.

These rates exclude the experience of plants at which lime was only a minor product, the chief output of the excluded plants being cement or some other commodity.

The exposure on which the accident rates here given were computed represents more than 81,000,000 man-hr., the equivalent of 9,000,000 man-shifts, or 6,909 men working 262 days per year for 5 yr. Two hundred and twenty-five plants were represented, some of which were operated during each of the five years while others were idle during one or more years of the 5-yr. period.

The accident-frequency rate for men in the quarries is considerably higher than that for men employed on work outside the quarries. The 5-yr.-average rate was 80.5 for quarrying and 47.9 for the kilns and other outside work. Speaking relatively, these rates stand as 100 for quarry work to 60 for outside work.

When the accident-frequency rates for the lime industry are compared with those for all quarries in the United States, including all related operations outside the quarries, the records of the Bureau of Mines show that the rates for the lime industry have exceeded the general rates by 27 to 48 per cent. during the four years 1929 to 1932, the latest years for which figures are available for both groups.

Simple, Efficient Design Characterizes Cincinnati Concrete-Mixing Plant

Plant Located to Serve Outlying Suburban and Industrial Sections

THAT the ready-mixed-concrete industry has as yet only scratched the surface of its possibilities is becoming increasingly evident as the effects of the depression wear off. New plants are being erected in virgin territories and additional facilities where existing plants do not completely cover the larger metropolitan areas. In the latter classification is the new central-mixing concrete plant of the Hilltop Builders' Supply Co., Cincinnati, O., which went into operation in April, 1934.

This company has for years operated a central-mixing concrete plant at North College Hill, a suburb northwest of Cincinnati. The new plant likewise is located in a suburb, Summit, which is about 9 mi. west of downtown Cincinnati. Both plants are ideally located to serve the near rapidly-growing residential and industrial sections and also the street and highway paving work in that vicinity.

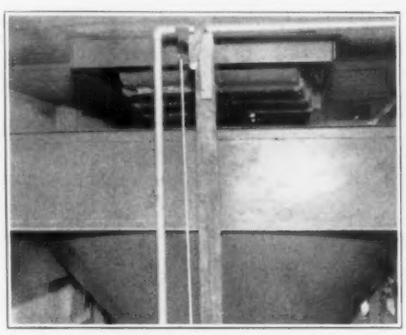
Aggregates for this plant are received by railway in hopper-bottom cars, the sand and gravel coming from a pit about 12 mi. northwest of the plant over the C. & O. Ry. The loaded cars are "spotted" on a sidetrack where they discharge into an underground hopper of 10-ton capacity. Through a slide gate the material is discharged to a roll feeder which releases it by chute into the main Robins belt-bucket-elevator running to the plant. This elevator operates on 120-ft. centers and discharges through a revolving spout into any of the six aggregate-storage bins. The spout is controlled by cable from the ground.

Central-mixing concrete plant of the Hilltop Builders' Supply Co., Cincinnati, O., with car at aggregate hopper.

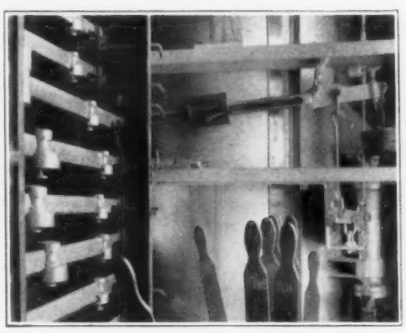
Bulk cement is received in special hopper cars and is unloaded into another track hopper. A Robins screw-conveyor feeds it to a steel-inclosed belt-bucket-elevator of the same make. Another Robins screw-conveyor at the top of the silo can discharge the cement into either of the two cement-storage bins through slide gates in the conveyor housing. The total cement-storage capacity is about 160 cu.yd. and the aggregate-storage capacity about 1,000 cu.yd.

Aggregates are fed into the 7½-ton capacity Neff & Fry weighing batcher through lever-operated clam-shell gates. Cement is fed to the cement batcher through sliding gates which are also lever-operated. The batcher scales are in a single rack with 10 beams, 3 for cement and 7 for aggregates. Two of the cement beams can be locked out for cement for state or other special work, leaving the main beam for regular orders. Six of the seven aggregate beams can also be locked out and used only for special jobs which use different proportions. Ordinarily as many beams are required as there are sizes of aggregates in any one mix.

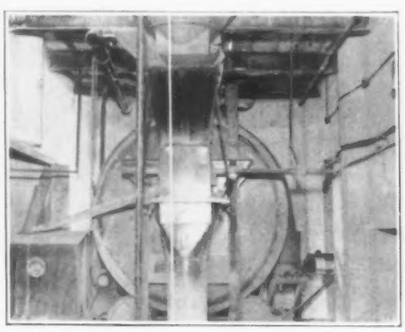
Water from the city



Aggregate weigh-batcher with clam-shell gates above.



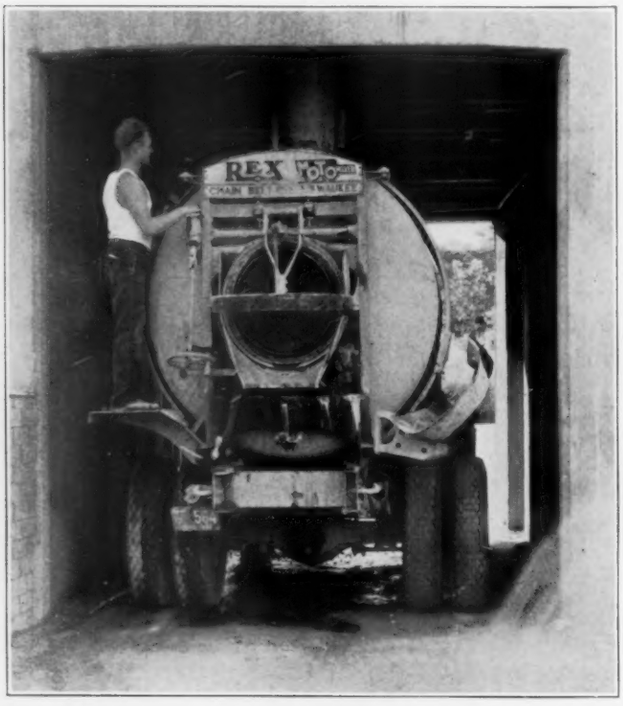
Batcher scales and gate levers with water tank in background.



The concrete mixer with spout by-passing from batchers to trucks.

mains is weighed in a 250-gal. Blaw-Knox automatic water-weighing tank. The scales, water-tank controls and gate levers are located so that all operations can be controlled by one man without moving from his post. Split chutes allow the discharge of the batched cement and aggregates either direct into mixer trucks or into the 1½-cu.yd. Ransome concrete mixer. When the material is mixed in the plant, the mixer trucks are used as agitators. The batching equipment is also used to measure dry-batched material and sized aggregates. Three Chain Belt Rex truck mixers are mounted on General Motors trucks fitted with Goodyear pneumatic tires. Other trucks for aggregate delivery include two Chevrolets and a Dodge, both equipped with regular end-dump bodies.

The reinforced-concrete silo which forms the bins and houses the batching and mixing equipment



One of the mixer trucks being loaded with concrete under the mixer floor.

was erected by the Macdonald Engineering Co. by its patented slip-form method. It is 32 ft. in inside diameter and 75 ft. high above the foundations. All the floor and bin slabs are of reinforced-concrete, and steel-sash windows are used throughout. A manually-operated man-lift elevator gives access to all parts of the plant.

The plant was designed by the Neff & Fry Co., who also supplied the batching equipment. The two screw-conveyors and elevators were furnished by the Robins Conveying Belt Co. The two screw-conveyors are driven by 5-hp. and 3-hp. G.E. motors, respectively, the cement and aggregate elevators by 10- and 15-hp. G.E. motors, and the mixer by a 30-hp. motor. The feeder is chain-driven from the tail-pulley of the aggregate elevator.

Portland-Cement Output in 1933

The output of 63,473,189 bbl. of Portland cement in 1933—a decline of 17 per cent. from 1932—was the lowest recorded since 1918 and represented a decrease of nearly 64 per cent. from the record high production of 1928.

Shipments of Portland cement from mills in 1933 amounted to 64,282,756 bbl., valued at $85,600,717, a decrease of 20 per cent. in quantity and an increase of over 4 per cent. in gross value. The average factory price per barrel in bulk in 1933 was $1.33, an increase of 32 c. per bbl. as compared with 1932.

Producers' stocks of Portland cement at the mills on Dec. 31, 1933—19,541,491 bbl.—showed a decrease of 4 per cent. from those at the end of 1932.

The commercial capacity for the production of finished Portland cement of the 152 plants shipping in 1933, and of 13 plants inactive in 1933 but producing within the five previous years, according to manufacturers' reports supplemented by a few estimates, was 269,387,000 bbl. No new plants were reported under production in 1933. The total production for 1933 was 23.6 per cent. of the indicated capacity at the close of the year the corresponding figure for 1932 is 28.3 per cent.

As compiled from the monthly estimates of the cement producers (there was no annual canvass on fuel consumption in 1933) supplemented by a few estimates by the Bureau of Mines, the following quantities of fuel were consumed at the Portland-cement plants in the United States in 1933, in the production of 63,473,189 bbl. of finished cement: Coal, 2,863,654 short tons; oil, 1,553,451 bbl. (65,328,942 gal.); and natural gas, 22,000,951,600 cu.ft.

In addition to the above fuels, one plant reported the use of manufactured gas with coal, and four plants the use of petroleum coke. The plants reporting petroleum coke also reported the use of other fuels.

The producers of Portland cement reported that approximately 19,923,000 short tons of raw materials were used in 1933 (exclusive of fuels and explosives). The totals were as follows: 16,117,000 tons of limestone and cement rock; 2,151,000 tons of clay or shale; 261,000 tons of blast-furnace slag; 416,000 tons of marl; 417,000 tons of gypsum; and 561,000 tons of other materials, such as oyster shells, iron ore, sand, cinders, and ashes.

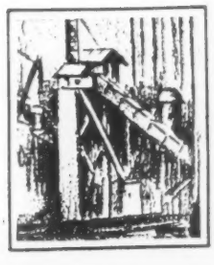
Aggregates Code *(from page 38)*

competition is keen. This, of course, has resulted in a great many unfair trade practices. No competitive game can be successfully conducted without rules and regulations. That is exactly what the N.R.A. is trying to do—establish such rules and regulations. The day of "hitting below the belt" in business is over. Let's back the administration in its effort to help put business on its feet and bring the country back to a healthy economic condition. It is not only a patriotic duty, but it is to our best interests to do so.

MEN OF THE INDUSTRY

S. RORDAM

S. RORDAM was born in Copenhagen in 1890. After graduating in chemical engineering from the Royal Polytechnical College in 1914 he joined F. L. Smidth & Co. Later he became affiliated with the Tunnel Portland Cement Co. in England, leaving in 1918 to become manager of White's South African Portland Cement Co. in Bloemfontein. In 1922 he was made production manager of the Port Kunda Portland Cement Co. in Esthonia, where he remained until late in 1924. He then came to America and joined the Cowham Engineering Co. He was made chief chemist of the Florida Portland Cement Co. in 1927 and was transferred to the Signal Mountain Portland Cement Co. in 1929. In 1931 he became Signal Mountain's chief chemist and in June of this year its superintendent.



Personal Mention

E. S. Guth, for many years district plant manager for the North American Cement Corp., with headquarters at Hagerstown, Md., has been appointed general plant manager.

B. P. Rex, bituminous sales engineer of the General Crushed Stone Co., has been transferred from the Easton, Pa., office of the company to Geneva, N. Y., where he will have general supervision of sales for the seven bituminous mixing plants operated by that company in the state of New York. The company's new plant at Oaks Corners has been completed and will be in charge of **L. M. Croel.**

Horace J. Young has been appointed by the Portland Cement Assn. as district engineer in charge of the Lincoln, Nebr., office. He succeeds D. D. Price who recently resigned to become chief engineer of the Platte Valley Public Power and Irrigation District.

H. S. McPherson has been appointed by United States Rubber Products, Inc., as manager of mechanical sales in the St. Louis, Mo., district. **W. G. Mueller** has been made manager of mechanical sales of the Boston, Mass., branch.

R. X. Raymond has been appointed by the Chain Belt Co., Milwaukee, Wis., as manager of the Minneapolis, Minn., district with offices at 808 La Salle Ave. He succeeds **G. A. Gunther,** who has been made manager of the Detroit, Mich., district with offices at 5169 Martin Ave.

Geo. B. Herington, D.Eng., consulting engineer, announces that, having finished the code organization work for the Regional Committee, Region 16, of the crushed stone, sand and gravel and slag industries, in Oregon, Washington, Idaho and Montana, on which he has been engaged for the past six months, he has resumed his practice as a consulting engineer with offices at 290 Multnomah Hotel Bldg., Portland, Ore.

D. M. Wilhelm, sales manager of the Patterson Foundry & Machine Co., East Liverpool, O., for the past four years, has been elected secretary of the company. He is succeeded as sales manager by **E. M. Underwood,** formerly division sales manager.

Chester M. Butler, chief chemist of the Marquette Cement Mfg. Co., Chicago, Ill., who has been with that company for 20 years, has been promoted to the position of chemical engineer. This is a new position in the company management which will involve extensive study of the chemical problems involved in cement manufacture and extensive travel both in this country and in Europe, according to W. A. Wecker, president of the company. Mr. Butler will also have general supervision of the chemical operations at both the company's plants. **G. Arnold Kelly,** formerly assistant to Mr. Butler, succeeds to the position of chief chemist.

W. C. McMahon, formerly superintendent of the Russelville, Ky., plant of the Kentucky Consolidated Stone Co., has been transferred to the plant of the company near Elizabethtown, Ky., where he now is superintendent.

William Nichols was recently appointed vice president in charge of sales of the Consolidated Co., material dealers of Chicago, Ill.

J. K. Jensen, president of the Janesville Sand & Gravel Co., Janesville, Wis., is vice president of the recently-incorporated Terry Penfiller Co., which was formed to manufacture a device to automatically fill modern fountain pens. Manufacture of these devices is now under way at the gravel company's headquarters.

W. A. Nugent was recently elected vice president in charge of sales of the Independent Pneumatic Tool Co., Chicago, Ill. Neil C. Hurley, Jr., was elected secretary.

Obituary

Fred Tielker, 69, president and general manager of the Northern Indiana Sand & Gravel Co., Wolcottville, Ind., died at his home in that city Aug. 30 of a heart attack.

James T. Burke, sales representative of the Universal Gypsum and Lime Co., Chicago, Ill., with headquarters in Kingston, N. Y., died Sept. 14 in that city following an operation.

John Alexander, 69, for 22 years a foreman in the plant of the Lone Star Cement Co. at Bonner Springs, Kans., died Aug. 19 as a result of uremic poisoning.

Amos E. Ferguson, 46, superintendent at the plant of the Funkhouser Co., Charmian, Pa., died Sept. 4, of injuries received in a fall in the company's mine.

▼ *Coming Events* ▲

October 1-5, 1934, Cleveland, O.—Twenty-third Annual Safety Congress and Exposition, National Safety Council, Carter, Statler and Cleveland Hotels, Cleveland, O.

December 3-8, 1934, New York, N. Y. Eleventh National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York City.

January 8-11, 1935, Washington, D. C.—Annual convention and show, American Road Builders' Assn., Willard Hotel, Washington.

Pittsburgh Concrete Code Budget Held Up

Need for further data is holding up the budget and method of contribution by members of the ready-mixed concrete industry in the Pittsburgh marketing area.

The amount of the budget proposed is $6,600, which would cover the period of March 1, 1934, to the same date in 1935. Members of the area would be assessed at the rate of $24 per yr. as a minimum and 7 c. per cu.yd. of production in excess of 343 cu.yd. for the period of July 1, 1933, to June 30, 1934, payable quarterly in advance.

The expense is required in the enforcement and administration of local problems under the code in that territory. Members of the area also must pay a contribution to the general code authority expenses.

New Corporations

THE CARRABINE SAND & GRAVEL CO., Webster Groves, Mo. T. L. Carrabine, Kirkwood, Mo., E. F. Breckenridge, Webster Groves, Mo., and others, incorporators.

OWEN CONCRETE CO., Akron, O. Capital 250 shares no par common. Incorporators, Frank Owen, Bertha Owen and Paul H. Wedling.

AMERICAN ASBESTOS PRODUCTS CO., Detroit, Mich. Capital 2,000 shares n. p. v.

NATIONAL STONE PRODUCTS, INC., Dover, Del. Capital 1,000 shares n. p. v. Organizers, C. S. Peabbles, R. R. Jones and W. T. Hobson, Wilmington. To deal in lands containing marble, rock, sand, gravel and lime.

TUFNEY LIME CO., Williamsport, Md. Capital 200 shares, par value $100. Incorporators, Dr. I. M. Wertz, Hagerstown, Md.; Elmer L. Swain, Williamsport, and Floyd N. Bowman, Sharpsburg, Md.

THE GRAND CANYON LIME & CEMENT CO. OF ARIZONA, Nelson, Ariz. Capital $300,000. Incorporators, Louis Schrimer, Sr., Louis Schrimer, Jr., Frank Powell, C. C. Merrill and Donald Fragner, all of Los Angeles.

GLASS FLUORSPAR CO., Princeton, Ky. Capital $1,000. Incorporators, J. E. Glass, C. B. Meadows, and Myrtle Glass Meadows.

NATURAL PRODUCTS, INC., Springfield, Ill. Capital 100 shares n. p. v. Incorporators, Charles A. Sartan and Harry Allyn, Kansas City; B. M. Cohn, 602 First National Bank Bldg., Springfield, Ill. To buy, sell and manufacture crude and finished products, deal in products of mills and quarries and sell stock in any one of these endeavors.

PLASTIC ENGINEERING CO., Chicago, Ill. Capital 20,000 shares n. p. v. common. Incorporators, B. F. Brice, P. B. Brice and A. R. Markham. To deal in brick, stone, lumber, cement, plastics, etc.

MOMENCE STONE PRODUCTS CO., Momence, Ill. Organizers, N. L. Litchfield, 1416 N. Wells St., Chicago; Leslie Fieleke, Momence, and Ray Moore, Chicago. To produce all sizes of crushed stone for road and building work as well as agricultural limestone.

HUB SAND & GRAVEL CO., Needham, Mass. Capital $50,000. Incorporators, Samuel Bagdasar, Watertown; John Kazar, Medford, and Patrick J. Sullivan, Medford.

Aggregates Statistics

THE quantity of crushed stone sold or used by producers in the United States in 1933 amounted to 45,490,610 short tons, a drop of 13 per cent. from 51,995,100 short tons in 1932. This total includes 40,857,120 short tons of stone used for concrete and road metal, a decrease of 15 per cent. from the comparable figure for 1932, and 4,633,490 short tons of railroad ballast, 17 per cent. more than in 1932.

The decline in production was not unexpected. In March, 1934, an estimate of 45,000,000 short tons was released through the Bureau of Mines, but on the basis of preliminary returns a total of 50,000,000 short tons was forecast in a release dated May 18, 1934. The slump in highway construction appears to have been responsible for a large part of the decline. Concrete-pavement contracts awards in 1933 were 53 per cent. below those of 1932, whereas building construction dropped only 7 per cent. A moderate increase in ballast production was expected because railroad expenditures for ballast in 1933 were 7 per cent. greater than in 1932.

By A. T. COONS

Bureau of Mines, Department of the Interior

Prices Lower.—Despite a stiffening of prices at the close of the year as the result of operation under the code the average net sales realization dropped from 90 c. a ton in 1932 to 86 c. in 1933. The average value of stone used for concrete and road metal decreased from 91 c. to 88 c., and for railroad ballast from 82 c. to 69 c. The total value of all crushed stone sold or used in 1933 amounted to $39,018,736, a decline of 17 per cent. from the 1932 figure.

Noncommercial Production Drops.—The quantity of crushed stone reported by states, counties, municipalities, or other government agencies in 1933 totaled 7,651,410 short tons, a decrease of 12 per cent. from 1932. This quantity, however, represents 17 per cent. of the total stone accounted for, exactly the same percentage as in 1932. The average value, 95 c. a ton, was greater than that for the output of commercial operations.

Truck Shipments Increase.—The trend from railway to highway shipments continued in 1933. More than 60 per cent. of all crushed stone (excluding railroad ballast) was transported by motor trucks in 1933, compared with 58 per cent in 1932. Virtually all noncommercial production in 1933 came from truck-shipping plants, and nearly 52 per cent. of the output of commercial operations also was shipped by truck.

Detailed statistics of the crushed-stone industry, including production by states, are given in the accompanying tables on this and the following pages.

SHIPMENTS OF CRUSHED STONE AGGREGATES IN 1932 AND 1933, BY COMMERCIAL AND NONCOMMERCIAL OPERATORS AND BY METHOD OF TRANSPORT

Method of Transport	Commercial Operations		Noncommercial Operations		Total[1]	
	Quantity (*short tons*)	Percentage of Total	Quantity (*short tons*)	Percentage of Total	Quantity (*short tons*)	Percentage of Total
1932:						
Railroad	12,268,670	31.2	200,240	2.3	12,468,910	26.0
Water	3,509,880	8.9			3,509,880	7.3
Truck	19,769,350	50.3	8,271,510	95.0	28,040,860	58.4
Unspecified	3,761,750	9.6	239,160	2.7	4,000,910	8.3
Total shipments	39,309,650	100.0	8,710,910	100.0	48,020,560	100.0
Total value					$43,651,774	
1933:						
Railroad	9,883,870	29.8	105,320	1.4	9,989,190	24.4
Water	2,479,240	7.5			2,479,240	6.1
Truck	17,146,120	51.6	7,546,090	98.6	24,692,210	60.4
Unspecified	3,696,480	11.1			3,696,480	9.1
Total shipments	33,205,710	100.0	7,651,410	100.0	40,857,120	100.0
Total value	$28,570,039		$7,273,279		$35,843,318	

[1] Exclusive of railroad ballast, virtually all of which is shipped by railway.

CRUSHED STONE SOLD OR USED BY PRODUCERS IN THE UNITED STATES IN 1933, BY STATES AND USES

State	Concrete and Road Metal		Railroad Ballast		Total	
	Amount (*short tons*)	Value	Amount (*short tons*)	Value	Amount (*short tons*)	Value
Alabama	[1] 142,910	[1] $ 69,995			[1] 142,910	[1] $ 69,995
Alaska	19,930	16,078			19,930	16,078
Arizona	87,010	85,042			87,010	85,042
Arkansas	308,140	312,973	71,590	$ 61,685	379,730	374,658
California	3,055,490	2,408,587	375,110	118,368	3,430,600	2,526,955
Colorado	209,520	163,684	[2]	[2]	[1] 209,520	[1] 163,684
Connecticut	[1] 872,130	[1] 689,041	147,520	98,183	[1] 1,019,650	[1] 787,224
Delaware	50,180	63,933	1,340	1,658	51,520	65,591
Florida	[1] 500,910	[1] 411,048	79,240	57,639	[1] 580,150	[1] 468,687
Georgia	709,510	541,913	27,500	18,545	737,010	560,458
Hawaii	251,630	454,407	90	139	251,720	454,546
Idaho	516,120	409,652			516,120	409,652
Illinois	1,796,030	1,217,708	126,220	85,447	1,922,250	1,303,155
Indiana	[1] 1,621,940	[1] 1,228,497	63,740	39,555	[1] 1,685,680	[1] 1,268,052
Iowa	880,450	793,090	46,640	21,485	927,090	814,575
Kansas	[1] 684,320	[1] 683,032	160,380	108,886	[1] 844,700	[1] 791,918
Kentucky	[1] 1,787,390	[1] 1,524,764	132,910	55,487	[1] 1,920,300	[1] 1,580,251
Louisiana	10,560	12,215	54,530	31,168	65,090	43,383
Maine	77,870	100,661			77,870	100,661
Maryland	517,580	541,419	127,200	143,950	644,780	685,369
Massachusetts	[1] 1,050,410	[1] 868,649	[1] 48,140	[1] 37,348	[1] 1,098,550	[1] 905,997
Michigan	[1] 466,070	[1] 289,439	36,490	22,819	[1] 502,560	[1] 312,258
Minnesota	[1] 205,120	[1] 218,855			[1] 205,120	[1] 218,855
Missouri	1,789,430	1,909,754	[1] 31,210	[1] 25,910	[1] 1,820,640	[1] 1,935,664
Montana	[1] 342,890	[1] 241,521			[1] 342,890	[1] 241,521
Nebraska	129,810	113,906	[2]	[2]	[1] 129,810	[1] 113,906
Nevada	2,330	1,185			2,330	1,185
New Hampshire	[1] 51,530	[1] 52,736			[1] 51,530	[1] 52,736
New Jersey	[1] 915,920	[1] 991,776	[1] 48,440	[1] 45,585	[1] 964,360	[1] 1,037,361
New Mexico	[2]	[2]	[2]	[2]	427,980	437,287
New York	[1] 4,926,070	[1] 4,230,444	[1] 440,480	[1] 361,693	5,859,050	5,040,909
North Carolina	[1] 363,640	[1] 396,814	[1] 112,010	[1] 97,143	571,140	650,317
Ohio	3,069,620	2,251,450	432,870	273,240	3,502,490	2,524,690
Oklahoma	[1] 470,970	[1] 364,180	[1] 215,380	[1] 103,525	708,730	477,453
Oregon	941,420	731,985	2,670	2,074	944,090	734,059
Pennsylvania	4,760,920	4,756,486	[1] 299,450	[1] 278,672	[1] 5,060,370	[1] 5,035,158
Puerto Rico	49,980	100,140	3,600	1,350	53,580	101,490
Rhode Island	[2]	[2]			[2]	[2]
South Carolina	228,380	271,221	93,510	74,081	321,890	345,302
South Dakota	71,550	85,001			71,550	85,001
Tennessee	800,850	757,056	233,790	172,142	1,034,640	929,198
Texas	1,006,610	691,115	106,150	78,152	1,112,760	769,267
Utah	[1] 58,480	[1] 29,242			[1] 58,480	[1] 29,242
Vermont	[1] 28,250	[1] 30,863			[1] 28,250	[1] 30,863
Virginia	[1] 1,233,100	[1] 1,088,070	398,710	291,582	[1] 1,631,810	[1] 1,379,652
Washington	995,160	767,413	33,270	11,121	1,028,430	778,334
West Virginia	392,250	501,720	225,610	137,043	617,860	638,763
Wisconsin	1,057,850	975,985	300	240	1,058,150	976,225
Wyoming	207,330	169,915	15,980	12,214	223,310	182,129
Undistributed	1,141,560	1,228,658	441,420	307,289	544,630	483,780
	40,857,120	35,843,318	4,633,490	3,175,418	45,490,610	39,018,736

[1] To avoid disclosing confidential information certain totals are somewhat incomplete, the figures not included being combined under "Undistributed."

[2] Included under "Undistributed."

The Austin-Western Road Machinery Co. has moved its general offices to its factory location at 601 Farnsworth Ave., Aurora, Ill.

Correspondence

Newspaper Propaganda

To the Editor:

I just had the opportunity of reading your editorial, "An Appeal for Sincerity," in a recent issue of PIT AND QUARRY. I wish this editorial could be given wide circulation because it has so much truth in it. In fact, it is the best answer I have seen to such iniquitous propaganda as is put out by the *Chicago Tribune* and the *Chicago Daily News*. The unfortunate part is the wide circulation that these papers have among people who let those editors do their thinking and who are not fully informed as to the purpose of the N.R.A. or other economic measures that confront us.

I believe I would be safe in saying that if a vote were taken of all the capital-goods industries which are operating under codes, a vast majority would favor the purpose of the N.R.A.

I am glad that you have taken this position in your editorial columns.

BERNARD L. MCNULTY, *President*,
Marblehaed Lime Co.
Chicago, Ill.

Rugged Individualism

To the Editor:

I read your editorial, *This Is My Business*, in a recent number.

The right to own and control property, just so long as one does not interfere with the liberty of someone else, is part of the foundation on which this country was built. This applies to industrial property as well as home property. If the time has come when the government controls our every move on our own property —when it taxes us and we have no standing as one who pays the bill—when it has the authority but we must still take the responsibility—then we have gone back just 160 years. If industry is to be under the orders of office-holders, who owe their offices to voters, then our greatest industry and most popular vocation must soon be politics.

I believe in the golden rule, but the golden rule never conflicted with the true, rugged individualism which built this country. To have progress men must have confidence that they will have control of that which they honestly earn.

CHARLES PARKS.
Albany, N. Y.

Personnel Changes in Industrial Brownhoist

The Board of directors of Industrial Brownhoist Corp., Bay City, Mich., announces that Alexander C. Brown resigned as president and treasurer of the company to become first vice president of Cleveland Cliffs Iron Co. of Cleveland, Ohio, on Sept. 20, 1934. Mr. Brown will continue as director. Melvin Pattison, formerly executive vice-president and secretary, has been elected president and treasurer; Edward S. Clark has been elected secretary. Hoyt E. Hayes, formerly export sales manager and manager Cleveland District sales, has been elected vice-president and sales manager and will shortly move to the general offices at Bay City. George A. Long, plant manager and assistant secretary, has been elected vice-president, in charge of manufacturing, and retains the office of assistant secretary. James B. Hayden han been appointed assistant sales manager. Others continuing in their present offices are: Ernest Taylor, vice-president, in charge of engineering and purchasing, and Arnold J. Copeland, assistant treasurer. The selection of officers by the board assures, for the company, continuity of management policies.

Engineering Staff of Tyson Bearing Enlarged

The Tyson Roller Bearing Corp., Massillon, Ohio, announces the following additions to its engineering and sales organization personnel in its service expansion program.

Robert W. Ballentine has been appointed district manager with headquarters in Milwaukee, Wis. Hyman Ledeen is appointed district manager with offices in San Francisco and Los Angeles to cover southwestern states. Ben L. Crew, Jr., sales engineer, has been assigned to the Detroit offices. E. L. Farnsworth has been appointed service sales representative with offices in New York.

New Birmingham Office for Chicago Pneumatic

The Chicago Pneumatic Tool Co., New York, N. Y., announces the change of address of its Birmingham, Ala., office from its former location, 1829-31 South Second Ave., to 211 South 20th St. This change was effected August 31 and provides increased facilities for both sales and service activities. W. S. Lynch is manager of the Birmingham District Office.

Bucyrus-Erie Appoints Two New Distributors

The Chain Belt Co., Milwaukee, Wis., announces the provision of a complete stock of chain and transmission equipment in its warehouse at Detroit, Mich. The office is being moved to 5169 Martin Ave., Detroit, alongside the warehouse and will remain in charge of C. E. Martin.

The executive offices of SKF Industries, Inc., after 20 years in New York, have been consolidated with the company's plant at Front St. and Erie Ave., Philadelphia, Pa. This action consolidates the company's executive, sales, engineering, research and production departments.

The Bucyrus-Erie Co., South Milwaukee, Wis., announce the appointment of Crook Co., 2900 Santa Fe Ave., Los Angeles, Cal., as distributor for its equipment in southern California. The Burgman Tractor-Equipment Co., 18 Riverside Viaduct, Jacksonville, Fla., has been appointed distributor in the northern part of Florida.

CRUSHED STONE SOLD OR USED BY PRODUCERS IN THE UNITED STATES, 1929 TO 1933, BY USES

Year	Concrete and Road Metal		Railroad Ballast		Total	
	Amount (*short tons*)	Value	Amount (*short tons*)	Value	Amount (*short tons*)	Value
1929	76,174,770	$80,685,493	16,546,490	$13,702,385	92,721,260	$94,387,878
1930	74,293,090	77,347,379	12,817,800	10,206,975	87,110,890	87,554,354
1931	65,811,520	64,908,509	6,812,890	5,496,455	72,624,410	70,404,964
1932	48,020,560	43,651,774	3,974,540	3,239,991	51,995,100	46,891,765
1933	40,857,120	35,843,318	4,633,490	3,175,418	45,490,610	39,018,736

CRUSHED STONE SOLD OR USED IN THE UNITED STATES BY COMMERCIAL AND NONCOMMERCIAL OPERATORS, 1929 TO 1933 [1]

Year	Commercial Operations			Noncommercial Operations			Total	
	Quantity (*short tons*)	Change from Previous Year (*per cent.*)	Percentage of Total	Quantity (*short tons*)	Change from Previous Year (*per cent.*)	Percentage of Total	Quantity (*short tons*)	Change from Previous Year (*per cent.*)
1929	85,409,260	.....	92.1	7,312,000	.....	7.9	92,721,260	+ 1.6
1930	79,560,890	− 6.8	91.3	7,550,000	+ 3.3	8.7	87,110,890	− 6.1
1931	64,818,410	−18.5	89.3	7,806,000	+ 3.4	10.7	72,624,410	−16.6
1932	43,284,190	−33.2	83.2	8,710,910	+11.6	16.8	51,995,100	−28.4
1933	37,839,200	−12.6	83.2	7,651,410	−12.2	16.8	45,490,610	−12.5

[1] Includes stone used for concrete and road metal, and railroad ballast. The figures for "noncommercial operation" represent tonnages reported by states, counties, municipalities, and other government agencies, produced either by themselves or by contractors expressly for their consumption, often with publicly-owned equipment. They do not include purchases from commercial producers. The figures for "commercial operations" represent tonnages reported by all other producers, including relatively small quantities of railroad ballast and fill produced directly by railroad carriers for their own use.

Latest Portland-Cement Statistics

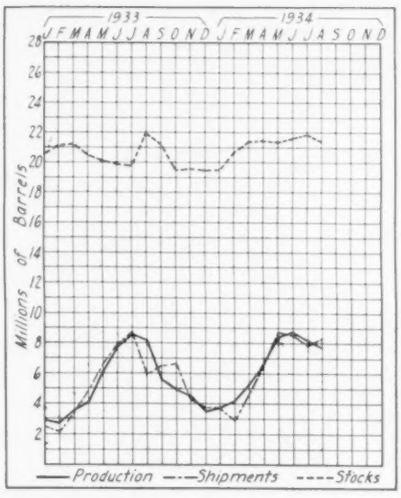


Chart showing monthly production, shipments and stocks on hand at end of month from January, 1933, to August, 1934.

THE Portland-cement industry in August, 1934, produced 7,863,000 bbl., shipped 8,297,000 bbl. from the mills, and had in stock at the end of the month 21,419,000 bbl. Production in August showed a decrease of 4.4 per cent. and shipments an increase of 38.4 per cent., as compared with August, 1933. Stocks at the mills were 3.0 per cent. lower than a year ago.

These statistics are compiled from reports received from all manufacturing plants except three, for which estimates have been included in lieu of actual returns.

In the following statement the total output of cement is compared with the estimated capacity of 163 plants at the close of August, 1934, and of 164 plants at the close of August, 1933.

RATIO (*per cent.*) OF PRODUCTION TO CAPACITY

	August		July	June	May
	1933	1934	1934	1934	1934
The month..	35.9	34.5	35.7	39.8	37.5
The 12 months ended	26.5	26.8	26.9	27.1	26.7

PRODUCTION, SHIPMENTS, AND STOCKS OF FINISHED PORTLAND CEMENT, BY MONTHS, IN 1933 AND 1934 (*in thousands of barrels*)

Month	Production		Shipments		Stocks At End of Month	
	1933	1934	1933	1934	1933	1934
January	2,958	3,779	2,502	3,778	20,624	19,547
February	2,777	4,168	2,278	2,952	21,125	20,762
March	3,684	5,257	3,510	4,618	21,298	21,422
April	4,183	6,544	4,949	6,492	20,542	21,557
May	6,262	8,554	6,709	8,784	20,117	21,301
June	7,804	8,786	7,979	8,539	19,936	21,600
July	8,609	8,134	8,697	7,893	19,848	a21,852
August	8,223	7,863	5,994	8,297	22,078	21,419
September	5,638	.....	6,517	.....	21,216	.....
October	5,037	.....	6,750	.....	19,502	.....
November	4,672	.....	4,463	.....	19,709	.....
December	3,526	.....	3,738	.....	a19,541	.....
Totals	63,373	.....	64,086	.....	.....	.....

a Revised.

DISTRIBUTION OF CEMENT (*a*)

Shipped to—	June		July		Shipped to—	June		July	
	1933	1934	1933	1934		1933	1934	1933	1934
Alabama	128,627	54,337	64,120	76,085	New Jersey	243,872	270,397	262,251	285,365
Alaska	924	2,229	1,959	2,856	New Mexico	7,737	25,889	15,563	25,090
Arizona	10,014	24,885	7,364	15,544	New York	1,070,796	1,049,819	1,161,461	978,403
Arkansas	b84,181	46,216	41,330	55,399	North Carolina	46,758	61,447	64,219	80,208
California	473,303	463,606	396,165	371,962	North Dakota	24,427	32,055	23,618	33,435
Colorado	34,690	45,758	41,755	64,350	Ohio	389,377	483,707	445,180	411,800
Connecticut	104,706	124,743	112,051	105,321	Oklahoma	150,303	136,378	122,487	115,418
Delaware	31,197	45,803	1a,933	31,607	Oregon	43,263	36,042	22,860	52,380
Dist. of Col	94,539	88,735	97,056	94,185	Pennsylvania	659,913	566,807	687,614	584,073
Florida	54,942	65,270	50,788	54,516	Porto Rico	6,250	11,988	15,645	12,261
Georgia	37,634	55,443	63,813	91,422	Rhode Island	56,332	53,074	51,412	49,123
Hawaii	12,717	30,006	12,794	13,482	South Carolina	17,301	28,877	27,886	28,677
Idaho	11,586	29,229	10,144	21,717	South Dakota	19,494	37,917	34,892	41,909
Illinois	347,314	557,475	1,124,429	512,159	Tennessee	b107,669	121,763	86,048	101,964
Indiana	350,728	326,093	357,953	323,604	Texas	339,004	324,339	248,184	275,683
Iowa	187,840	297,842	210,017	237,122	Utah	17,867	28,513	26,258	18,483
Kansas	92,726	153,683	123,059	114,941	Vermont	18,735	43,224	26,815	25,367
Kentucky	179,813	122,911	152,711	125,254	Virginia	117,078	140,554	133,612	126,463
Louisiana	59,178	81,409	47,917	91,859	Washington	58,175	97,178	66,370	101,887
Maine	60,431	37,802	71,464	30,862	West Virginia	59,554	115,949	74,336	102,598
Maryland	78,909	137,133	93,838	161,833	Wisconsin	328,486	379,484	370,525	338,500
Massachusetts	220,410	192,352	223,632	191,942	Wyoming	8,377	20,369	9,904	15,394
Michigan	514,119	473,640	419,326	365,756	Unspecified	b30,745	5,811	0	63
Minnesota	235,967	171,954	192,668	202,247		7,881,231	8,499,883	8,641,177	7,857,078
Mississippi	89,638	63,418	72,004	79,266	Foreign countries	97,769	39,117	55,823	35,922
Missouri	317,173	216,904	369,385	177,605					
Montana	23,086	29,299	18,330	37,841	Total shipped from cement plants	7,979,000	8,539,000	8,697,000	7,893,000
Nebraska	135,231	185,585	78,106	95,554					
Nevada	61,124	231,532	136,152	262,265					
New Hampshire	27,171	73,010	57,774	43,978					

a Includes estimated distribution from 3 plants in June and July, 1933; from 2 plants in June and July, 1934. *b* Revised.

Baldwin Takes Sales of Whitcomb Locomotive

Effective Sept. 17, 1934, The Baldwin Locomotive Works, Philadelphia, Pa., assumed all sales and engineering of the products of its subsidiary, The Whitcomb Locomotive Co., Rochelle, Ill., and established an Internal-Combustion Locomotive Section of its sales department, in charge of H. H. Perry as manager, assisted by H. V. Huleguard. Mr. Perry is now vice-president and general manager, and Mr. Huleguard, sales manager of The Whitcomb Locomotive Co. The new section will handle all sales of Baldwin and Whitcomb internal combustion locomotives of all sizes, and sales of electric locomotives except to public service railroads. Whitcomb domestic sales agents will continue to sell in the name of Whitcomb.

The Whitcomb plant will continue the manufacture of Whitcomb products at Rochelle, Ill., in charge of Thomas H. Mars as superintendent. Orders for repair parts, and the servicing of Whitcomb produtcs in the field, together with attendant correspondence will be handled at Rochelle by L. W. Wrenn as Baldwin Sales Correspondent.

Communications addressed to the Internal-Combustion Locomotive Section should be sent in care of the Baldwin Locomotive Works, Paschall Station P. O., Philadelphia, Pa.

American Cyanamid Buys Burton Explosives, Inc.

The plant and business of Burton Explosives, Inc., Cleveland, O., have been acquired by the American Cyanamid & Chemical Corp., a subsidiary of the American Cyanamid Co., with general offices at 30 Rockefeller Plaza, New York, N. Y. The Burton organization, together wit hthe explosives plant at New Castle, Pa., will be merged as the Burton Explosives Division and will be under the management of J. S. Burton, former president of the Burton company.

Warehouse for Link-Belt Opened in Dallas, Texas

The Link-Belt Co., Chicago, Ill., has opened a warehouse at 413-15 Second Ave., Dallas, Tex., where extensive stocks of Caldwell and Link-Belt conveying and power transmitting machinery will be carried. Facilities are available for rail and truck shipments. The company's sales offices will also be located at the new warehouse with E. G. Wendell as resident manager.

Lime Shipments

JUNE witnessed the second decrease in lime shipments since the beginning of the upward trend last November. Shipments, which had reached a 1934 "peak" of 170,610 tons in May, fell to 137,451 tons in June (Table I). The other decline occurred in February, when shipments fell 778 tons below the January figure, 111,712. Of the June total, 84,039 tons was quicklime and 50,497 tons hydrated lime. These represented declines of 18.8 and 20.4 per cent. respectively from the May shipments.

Chemical lime (94,529 tons) constituted 70.2 per cent. of the total lime shipped. Agricultural lime (13,999 tons) amounted to 10.4 per cent. and building lime (26,008 tons) to 19.4 per cent. of the total. Shipments of building lime nearly equalled those of May, the loss being only 121 tons. Agricultural-lime shipments were 55.6 per cent. less and those of chemical lime 13.5 per cent. less than the May records.

The upward trend of prices, begun in December, continued. The reported average value of all lime shipped in June was $7.88, which was 20 c. (2.6 per cent.) higher than in May (Table II). The average value of agricultural lime rose from $8.53 in May to $9.21 in June, an increase of 9.1 per cent.; that of building lime fell from $10.56 in May to $10.43 in June, a loss of 1.04 per cent.; while that of chemical lime rose from $6.75 in May to $6.94 in June, a gain of 2.8 per cent. The greatest increase—$1.66 per ton or 9.8 per cent.—occurred in the case of chemical lime shipped in barrels.

From May to June the average price of bulk quicklime rose from $6.19 to $6.35; that of quicklime in barrels fell from $17.24 to $16.88; that of quicklime in bags rose from $9.73 to $10.42. The average price of hydrate dropped from $8.54 to $8.61.

The ratio of shipments to capacity fell to 34.6 per cent. for the country as a whole (Table III). The "peak" of the year, 42.9 per cent., was reached in May. The ratio was highest (49.0 per cent.) in District 2 (New Jersey, Delaware, Maryland and eastern Pennsylvania) and lowest (18.6 per cent.) in District 15 (California, Nevada, Utah, Arizona, Colorado and New Mexico).

Table I.—SHIPMENTS OF LIME IN 1933 AND 1934, BY KINDS AND USES (*tons*)

Month	Kinds[1]	Uses			Totals
		Agriculture	Building	Chemical	
1933					
November	Quicklime	932	7,971	59,292	65,195
	Hydrate	2,379	9,414[2]	20,000	31,793
	Totals	3,311	17,385	79,292	99,988
December	Quicklime	563	5,817	68,242	74,622
	Hydrate	3,240	8,053[2]	20,208	31,501
	Totals	3,803	13,870	88,450	106,123
1934					
January	Quicklime	547	7,544	71,359	79,450
	Hydrate	3,171	11,062[2]	18,029	32,262
	Totals	3,718	18,606	89,388	111,712
February	Quicklime	601	5,384	75,561	81,546
	Hydrate	2,435	7,238[2]	19,715	29,388
	Totals	3,036	12,622	95,276	110,934
March	Quicklime	2,541	9,538	85,918	97,997
	Hydrate	9,695	10,570[2]	24,152	44,417
	Totals	12,236	20,108	110,070	142,414
April	Quicklime	5,945	12,531	75,187	93,663
	Hydrate	26,990	14,476[2]	20,722	62,188
	Totals	32,935	27,007	95,909	155,851
May	Quicklime	5,184	11,569	86,807	103,560
	Hydrate	26,392	14,560[2]	22,503	63,455
	Totals	31,576	26,129	109,310	167,015
June	Quicklime	1,555	11,314	71,170	84,039
	Hydrate	12,444	14,694	23,359	50,497
	Totals	13,999	26,008	94,529	134,536

[1] Do not include the following miscellaneous lime: November, 608 tons; December, 1,737 tons; January 725 tons; February, 572 tons; March, 1,285 tons; April, 3,136 tons; May, 3,595 tons; June, 2,915 tons.
[2] Does not include finishing lime.

Table II.—SHIPMENTS OF LIME IN JUNE, 1934, BY KINDS AND USES

Kinds[1]	Agriculture		Building[2]		Chemical		Totals	
	Tons	Per Ton	Tons	Per Ton	Tons	Per Ton	Tons	Per Ton
Quicklime:								
In bulk	442	6.23	3,704	8.19	67,035	6.25	71,181	6.35
In barrels	600	18.65	4,117	16.30	785	18.56	5,502	16.88
In bags	513	9.29	3,493	11.88	3,350	9.07	7,356	10.42
Hydrate	12,444	8.86	14,694	9.00	23,359	8.23	50,497	8.61
Totals or Averages	13,999	9.21	26,008	10.43	94,529	6.94	134,536	7.85

[1] Do not include 2,915 tons of miscellaneous lime.
[2] Does not include finishing lime.

Table III.—SHIPMENTS AND VALUE OF LIME AND RATIO OF SHIPMENTS TO CAPACITY IN 1933 AND 1934, BY MONTHS

Month	Total Capacity of Concerns Reporting[1] (*tons*)	Shipments Reported (*tons*)	Average Value Per Ton	Ratio of Shipments to Capacity (*per cent.*)												
				United States	Districts											
					1	2	3	4	5B	6-8-9	7	10-11	12	13	14	15
1933																
October	347,446	109,818	$6.84	31.6	15.6	26.1	48.6	32.5	26.1	20.9	46.6	35.5	29.7	21.8	38.2	17.9
November	392,947	100,596	7.01	25.6	15.1	20.0	32.0	22.3	24.2	18.5	37.6	34.4	22.2	26.3	23.2	18.4
December	390,553	107,860	6.72	27.6	17.7	16.3	40.0	21.1	27.9	15.2	41.1	33.8	25.9	22.9	20.3	19.6
1934																
January	392,636	112,437	7.31	28.6	12.2	19.4	39.6	26.3	33.0	23.8	38.1	43.0	36.1	23.4	17.4	17.1
February	406,215	111,506	7.17	27.4	9.7	19.3	35.7	25.5	38.4	18.3	35.9	37.2	42.9	25.5	26.2	18.5
March	392,806	143,699	7.50	36.5	15.5	35.1	47.8	40.4	31.7	25.3	48.2	40.3	49.4	24.7	52.4	26.4
April	391,860	158,987	7.66	40.5	24.4	55.4	53.0	50.7	38.9	29.2	43.7	39.1	44.9	26.5	24.8	20.4
May	397,365	170,610	7.68	42.9	26.9	53.6	62.8	49.4	37.3	28.7	49.8	46.7	36.8	28.7	25.1	23.0
June	396,174	137,451	7.88	34.6	23.8	32.1	49.0	46.3	30.4	25.5	45.4	32.7	34.1	30.4	31.3	18.6
July																
August																
September																

[1] Idle capacity reported as follows: October, 27,414 tons; November, 18,673 tons; December, 12,679 tons; January, 12,687 tons; February, 14,150 tons; March 7,313 tons; April, 3,564 tons; May, 6,397 tons ; June, 7,152 tons. [2] Revised.

Labor Conditions

THE recession in employment and pay-rolls which occurred in the non-metallic-mineral industries in July was partially checked in August, according to preliminary figures. Since the last report—pp. 49-50, PIT AND QUARRY, September, 1934—detailed figures for June have become available.

Quarrying Industry.—The 1,149 concerns which reported on conditions for June employed 38,250 workers in that month, the highest number in 12 months (Table I). The employment index was 56.6 (taking the 3-yr. average, 1923 to 1925, as 100), an increase of 4.4 per cent. over May and 19.7 per cent. over June, 1933. In July 1,087 concerns reporting had only 34,830 workers on their rolls. The July employment index fell one point to 55.6 a loss of 1.9 per cent. for the month but a gain of 12.3 per cent. for the year. In August 1,122 concerns reported 36,151 workers employed.

The August index figure was 54.7, a loss of 1.5 per cent. from July but a gain of 6.0 per cent. over a year ago.

One-week pay-rolls rose in June to $648,890, the highest figure in a year. The pay-roll index stood at 37.0, 5.5 per cent. above May's and 34.5 per cent. above that of June, 1933. The one-week pay-rolls of 1,087 concerns reporting in July were only $568,501, but those of the 1,122 concerns reporting in August were $580,114, which was the highest month in a year except for the May and June records.

Per-capita weekly earnings in June fell 8 c. from the May "peak" of $17.04, but were otherwise the highest in 12 months. This figure represents a percentage gain of 12.6 above the rate of June, 1933. The average hours worked per week, 35.8, were 1.4 per cent. above the May figure but 11.9 per cent. below the June, 1933, level. Average hourly earnings rose to 48 c., a gain of .8 per cent. for the month and 30.1 per cent. for the year.

Ten establishments raised their wage rates in June and 412 workers were affected (Table II). Similar increases affecting 2,495 workers, had been made in May. There have been no decreases in wage rates since last December, when there was 1 such change affecting 13 workers. The last previous reductions occurred in October, 1933, when 73 workers employed in 2 plants were affected.

A comparison of May and June employment and pay-rolls in 1,177 identical establishments is given in Table III. This shows gains in employment in 22 states, ranging from .5 per cent. in Wisconsin to 106.3 per cent. in Nebraska. Eight states—Alabama, Illinois, Minnesota, Nebraska, New Hampshire, Texas, Washington and West Virginia—reported employment increases of more than 10 per cent. Losses of approximately 31 per cent. occurred in Colorado and Mississippi.

One-week pay-rolls increased in 24 states, the gains ranging from 2.4 per cent. in Connecticut to 77 per cent. in Nebraska. In five states—Alabama, Colorado, Illinois, Nebraska and New Hampshire—the increases were 20 per cent. or more. Five states—Colorado, Connecticut, Iowa, New Jersey and New York—showed pay-roll increases despite reductions in the numbers of workers employed. In only three states—Florida, Montana and Wisconsin—were increases in employment accompanied by decreases in one-week pay-rolls.

Table I.—EMPLOYMENT, PAY-ROLLS AND EARNINGS IN THE QUARRYING AND NONMETALLIC-MINING INDUSTRIES, IN 1933 AND 1934, BY MONTHS

(Gains are shown in bold-faced type, losses in light-faced type)

Month	Establishments Reporting	Employment				Pay-Rolls				Per-Capita Weekly Earnings			Average Hours Worked per Week			Average Hourly Earnings		
		Employees on Pay-Rolls	Index of Employment[1]	Percentage Change From—		Amount of Pay-Rolls (1 week)	Index of Pay-Rolls[1]	Percentage Change From—		Average for Month	Percentage Change From—		Average for Month	Percentage Change From—		Average for Month	Percentage Change From—	
				Preceding Month	Year Ago			Preceding Month	Year Ago		Preceding Month	Year Ago		Preceding Month	Year Ago		Preceding Month	Year Ago
1933																		
August	1,142	34,553	57.6	**4.2**	**1.0**	$520,098	29.9	**5.1**	**.7**	$15.05	**.9**	.3	38.7	7.0	.....	40.4c.	**8.8**	.....
September	1,152	35,442	52.6	**1.9**	**.4**	516,932	29.3	2.0	3.9	14.59	3.8	4.3	34.4	1.11	.....	42.8c.	7.1	.....
October	1,202	36,894	53.2	**1.1**	**1.5**	566,803	31.2	**6.4**	**3.7**	15.36	**5.2**	**2.1**	34.8	**1.4**	.....	44.7c.	**3.5**	.....
November	1,185	34,303	51.1	3.9	**3.4**	497,238	28.3	9.3	**4.4**	14.50	5.5	**.9**	32.5	6.6	.....	45.2c.	**1.1**	.....
December	1,162	30,658	45.3	11.3	**7.1**	434,751	24.4	13.7	**10.4**	14.18	2.7	**3.3**	31.3	3.7	.....	46.1c.	**.9**	.....
1934																		
January	1,144	26,217	39.7	12.5	**13.1**	368,224	21.3	12.6	**17.7**	14.05	.1	**4.1**	30.8	1.9	.....	45.6c.	.2	.....
February	1,192	26,561	38.8	2.2	**11.5**	374,577	21.0	1.5	**20.7**	14.10	.7	**8.2**	31.1	**1.3**	.....	45.4c.	[2]	.....
March	1,180	28,610	42.0	**8.3**	**19.7**	434,572	24.1	**14.8**	**35.4**	15.19	**5.9**	**13.2**	33.5	**6.3**	2.7	45.6c.	.7	**17.7**
April	1,186	32,629	48.7	**15.9**	**23.9**	522,154	29.9	**23.9**	**48.0**	16.00	**6.9**	**19.5**	34.2	**4.0**	4.3	46.9c.	**2.6**	**27.1**
May	1,148	36,111	54.3	**11.4**	**25.1**	615,248	35.0	**17.3**	**47.1**	17.04	**5.3**	**17.7**	36.0	**4.0**	8.0	47.5c.	**.8**	**30.1**
June	1,149	38,250	56.6	**4.4**	**19.7**	648,890	37.0	**5.5**	**34.5**	16.96	**1.1**	**12.6**	35.8	**1.4**	11.9	48.0c.	**.8**	**30.1**
July	1,087	34,830	55.6	1.9	**12.3**	568,501	35.0	5.4	**23.2**	.....	.....	.....	.....	.....	.....	.....	.....	.....
August	1,122	36,151	54.7	1.5	**6.0**	580,114	34.0	2.8	**13.7**	.....	.....	.....	.....	.....	.....	.....	.....	.....

[1] Before March 1, 1934, the index numbers were based on 1926 = 100; since then they have been based on the 3-yr. average, 1923 to 1925, as 100.
[2] No change.

Table II.—CHANGES IN WAGE RATES IN THE QUARRYING AND NONMETALLIC-MINING INDUSTRIES, IN 1933 AND 1934, BY MONTHS

Month Ended	Establishments Reporting	Employees	No Change		Increases		Decreases	
			Establishments	Employees	Establishments	Employees	Establishments	Employees
July 15	1,144	26,217	1,138	26,149	6	68	.....	.....
Aug. 15	1,142	34,553	1,033	29,638	109	4,915	.....	.....
Sep. 15	1,152	35,442	1,059	32,390	93	3,052	.....	.....
Oct. 15	1,202	36,894	1,179	35,305	21	1,516	2	73
Nov. 15	1,185	34,303	1,178	34,132	7	171	.....	.....
Dec. 15	1,162	30,658	1,149	30,431	12	214	1	13
Jan. 15	1,144	26,251	1,138	26,149	6	68	.....	.....
Feb. 15	1,192	26,561	1,189	26,536	3	25	.....	.....
Mar. 15	1,180	28,610	1,179	28,550	1	60	.....	.....
Apr. 15	1,186	32,629	1,166	31,007	20	1,622	.....	.....
May 15	1,148	36,111	1,123	33,616	25	2,495	.....	.....
June 15	1,149	38,250	1,139	37,838	10	412	.....	.....

Table V.—CHANGES IN WAGE RATES IN THE CEMENT INDUSTRY, IN 1933 AND 1934, BY MONTHS

Month Ended	Establishments Reporting	Number of Employees	No Change		Increases		Decreases	
			Establishments	Employees	Establishments	Employees	Establishments	Employees
July 15	122	16,072	108	13,482	14	2,590	.....	.....
Aug. 15	111	15,787	60	5,081	51	10,706	.....	.....
Sep. 15	129	15,545	126	15,451	3	94	.....	.....
Oct. 15	131	13,199	128	12,609	3	510	.....	.....
Nov. 15	113	10,071	113	10,071	.....	.....	.....	.....
Dec. 15	129	10,851	129	10,851	.....	.....	.....	.....
Jan. 15	121	9,495	121	9,495	.....	.....	.....	.....
Feb. 15	125	12,745	125	12,745	.....	.....	.....	.....
Mar. 15	120	13,023	120	13,023	.....	.....	.....	.....
Apr. 15	119	12,414	96	7,694	23	4,720	.....	.....
May 15	122	17,593	115	16,372	7	1,221	.....	.....
June 15	131	19,459	119	17,259	12	2,200	.....	.....

Cement Industry.—Employment in the cement industry in August showed a drop of 5.8 per cent. in the index number (55.0) as compared with July's figure (58.4), which was 1.2 per cent. under June's (Table IV). August was 12.7 per cent. above August, 1933, and July was 16.3 per cent. ahead of the preceding July. In August the 123 establishments from whom reports were received employed 16,920 workers.

The August one-week pay-roll index (35.4) was 9.4 per cent. below July's but 20.0 per cent. above that of August, 1933. The July figure (39.1) was 1.9 per cent. below that of June but 40.6 per cent. higher than that of July of last year. One-week pay-rolls in July were $387,041, and were exceeded only by those of July ($395,590) in more than 12 months. Those of August, however, fell to $323,831, the lowest figure since April.

Per-capita weekly earnings in June, the latest month for which data are available, were $20.33, the highest in a year. This figure was 8.5 per cent. above May's and 23.9 per cent. higher than that of June, 1933.

The average number of hours worked per week in June reached 35.6, which was exceeded only by August, 1933, when the figure was 36. The June figure was 8.9 per cent. above May's but 8.0 per cent. lower than that of June, 1933.

Average hourly earnings in June (56.4 c.) showed a slight decline (.9 per cent.) from the May level, but a gain of 39.1 per cent. over the June, 1933, figure.

Wage-rate increases continued in June, 12 establishments of the 131 reporting having raised the rates of pay of 2,200 workers (Table V). No decreases have been reported in more than a year.

Table III.—COMPARISON OF EMPLOYMENT AND PAY-ROLLS IN IDENTICAL QUARRY AND NONMETALLIC-MINING ESTABLISHMENTS, IN MAY AND JUNE, 1934, BY STATES

(Gains are shown in bold-faced type, losses in light-faced type)

State	Number of Establishments	Number on Pay-Roll, June, 1934	Percentage of Change from May, 1934	Amount of Pay-Roll (1 week) June, 1934	Percentage of Change from May, 1934
Alabama	16	764	**19.4**	$10,118	**31.1**
Arizona					
Arkansas	9	236	**2.2**	3,464	**6.0**
California	37	1,192	**7.5**	24,987	**10.9**
Colorado	5	28	31.7	486	**30.3**
		278	13.1	5,744	**2.4**
Connecticut	23				
Delaware					
District of Columbia					
Florida	17	858	**.6**	10,149	3.6
Georgia	28	1,464	5.4	14,747	6.6
Idaho					
Illinois	19	738	**14.4**	14,448	**19.6**
Indiana	61	1,817	**9.5**	31,194	**7.4**
Iowa	27	549	5.0	9,350	**1.3**
Kansas	33	1,264	**3.4**	27,105	**12.9**
Kentucky	40	1,158	.2	13,927	.4
Louisiana	7	722	**4.9**	9,284	**6.2**
Maine	11	492	20.0	10,922	21.5
Maryland	14	408	**6.8**	6,691	**12.8**
Massachusetts	21	481	5.1	10,714	5.8
Michigan	44	1,842	1.2	35,072	.9
Minnesota	20	361	**16.8**	5,520	**9.9**
Mississippi	8	150	30.6	1,543	56.9
Missouri	57	1,425	1.5	19,309	3.1
Montana	8	67	**8.1**	1,047	3.4
Nebraska	11	425	**106.3**	5,203	**77.0**
Nevada					
New Hampshire	10	356	**67.1**	9,194	**71.1**
New Jersey	34	570	.2	11,508	**8.5**
New Mexico					
New York	79	2,836	**4.6**	61,947	**10.4**
North Carolina	13	339	11.7	4,637	14.1
North Dakota					
Ohio	139	4,095	**3.0**	70,718	**4.1**
Oklahoma	14	176	8.3	1,795	**4.2**
Oregon	5	114	1.7	2,083	9.2
Pennsylvania	186	15,057	8.7	404,318	15.2
Rhode Island					
South Carolina	4	120	**2.6**	1,378	**1.0**
South Dakota	6	82	**1.2**	1,275	**10.8**
Tennessee	22	839	1.3	9,382	3.5
Texas	21	1,600	**12.8**	28,197	**4.4**
Utah	8	113	31.1	2,034	7.4
Vermont	38	2,157	2.1	41,641	4.8
Virginia	30	1,230	**7.8**	15,559	**4.0**
Washington	15	577	**22.8**	9,609	**9.6**
West Virginia	23	1,113	**14.0**	16,686	**9.5**
Wisconsin	14	386	**.5**	5,924	17.4
Wyoming					
Totals	1,177	48,479		$968,909	

Asphalt Book Discusses Skidding Characteristics

The Asphalt Institute on June 15 published No. 2 of a booklet entitled Research Series which discusses a paper, "Skidding Characteristics of Road Surfaces" presented by Prof. R. A. Moyer of Iowa State College before the Thirteenth Annual Meeting of the Highway Research Board Dec. 7, 1933. This booklet contains abstracts from this paper and Prof. Moyer's conclusions as to the relative merits of the various types of pavements discussed.

Table IV.—EMPLOYMENT, PAY-ROLLS AND EARNINGS IN THE CEMENT INDUSTRY, IN 1933 AND 1934, BY MONTHS

(Gains are shown in bold-faced type, losses in light-faced type)

Month	Establishments Reporting	Employment				Pay-Rolls				Per-Capita Weekly Earnings			Average Hours Worked per Week			Average Hourly Earnings		
		Employees on Pay-Rolls	Index of Employment[1]	Percentage Change From—		Amount of Pay-Rolls (1 week)	Index of Pay-Rolls[1]	Percentage Change From—		Average for Month	Percentage Change From—		Average for Month	Percentage Change From—		Average for Month	Percentage Change From—	
				Preceding Month	Year Ago			Preceding Month	Year Ago		Preceding Month	Year Ago		Preceding Month	Year Ago		Preceding Month	Year Ago
1933																		
August	111	15,787	48.8	**5.8**	**28.4**	$287,508	29.5	**15.0**	**26.1**	$18.21	**8.7**	1.5	36.0	7.4	.....	50.2c.	**17.0**	.....
September	129	15,545	44.0	9.7	**5.0**	256,836	23.9	19.0	2.4	16.52	10.4	7.3	31.8	11.6	.....	52.2c.	**3.9**	.....
October	131	13,119	38.0	13.7	11.4	240,984	22.9	4.5	9.1	18.37	**10.7**	**2.1**	34.5	**8.4**	.....	54.3c.	**4.0**	.....
November	113	10,071	37.8	.4	7.8	177,760	21.2	7.1	8.6	17.65	6.7	.8	32.0	7.2	.....	52.8c.	2.7	.....
December	129	10,851	33.6	11.3	**2.1**	172,067	17.6	17.1	**2.3**	15.86	6.6	**.2**	28.5	10.9	.....	54.2c.	**2.6**	.....
1934																		
January	121	9,495	32.6	2.8	**8.7**	164,507	17.9	**1.7**	**19.3**	17.33	**4.6**	**9.3**	31.4	**7.9**	.....	55.7c.	1.1	.....
February	125	12,745	37.6	**15.2**	**26.6**	212,111	20.8	**16.2**	**39.6**	16.64	**.8**	**10.2**	30.8	**4.1**	.....	53.1c.	1.7	.....
March	120	13,023	42.4	**3.4**	**30.1**	224,218	24.1	**7.0**	**46.1**	17.22	**3.5**	**11.7**	31.9	**4.6**	10.6	53.6c.	**.2**	**29.9**
April	119	12,414	48.0	**13.3**	**24.0**	245,774	30.6	**27.0**	**65.4**	19.80	**12.1**	**33.3**	35.3	**7.6**	**3.6**	55.5c.	**3.7**	**33.3**
May	122	17,593	57.6	**20.0**	**42.2**	332,867	35.8	**17.1**	**68.1**	18.92	2.4	**18.3**	33.2	3.5	13.0	56.8c.	**2.2**	**39.0**
June	131	19,459	59.1	**2.6**	**27.1**	395,590	39.9	**11.4**	**57.7**	20.33	**8.5**	**23.9**	35.6	**8.9**	8.0	56.4c.	.9	**39.1**
July	129	19,158	58.4	1.2	**16.3**	387,041	39.1	1.9	**40.6**	.....	.....	.....	.....	.....	.....	.....	.....	.....
August	123	16,920	55.0	5.8	**12.7**	323,831	35.4	9.4	**20.0**	.....	.....	.....	.....	.....	.....	.....	.....	.....

[1] Before March 1, 1934, the index numbers are based on 1926 = 100; since then they have been based on the 3-yr. average, 1923 to 1925, as 100.

Foreign Developments

Criticize a New Device For Sintering Cement

Several articles have appeared in the German technical press criticizing and commenting on the article of E. Schirm in *Zement* (23:317-323) discussing a new apparatus for sintering Portland cement clinker on a traveling grate (abstracted in the August PIT AND QUARRY, p. 48). A number of objections from the standpoint of practice are raised by W. Kemmann—*Zement* for Aug. 9 (23:457-459)—who maintains that although the Metallgesellschaft sintering grate discussed by Schirm is, like all other attempts to apply to the burning of cement the sintering process well developed in metallurgy, highly interesting, it is not yet in any position to revolutionize the cement industry or to replace either the shaft or the rotary kiln.

Kemmann is particularly concerned with the heat consumption of the process and apparatus Schirm describes, which he (Kemmann) says would be around 1,430 cal. per kg. of clinker, including the heat required to heat the "dead" material that accompanies the useful charge, the ignition of the fuel and the evaporation of moisture. Even when 40 per cent. of water is evaporated, rotary kilns reach a heat consumption of 1,420 cal. per kg., and in the Lepol process the heat consumption is as low as 780 to 900 cal.

The writer also objects to the consumption of power, a point Schirm does not discuss, but which Kemmann computes at at least 27 kw.-hr. for 1,000 kg. of clinker, as against 9.5 kw.-hr. attained with the Lepol process. Also, because of the handling of about twice as much dead load as useful charge, the size of the installation would have to be considerably larger than the original article indicates. A further disadvantage is that the fuel applicable is practically limited to coke or anthracite. Kemmann finally maintains that the product of the sintering grate described would be difficult to grind.

Combination of Water and Setting of Cement

Investigations conducted by the writers concerning the nature of the combination of water in hardened Portland cement confirm the findings of earlier investigators, according to which the greater part of the water is combined zeolitically, in so far as it is not taken up as water of hydration in the calcium hydroxide. Also, smaller amounts of water are combined as water of hydration in silicate and aluminate hydrates. Neither the water combined zeolitically nor the water combined with the hydrates is of importance for maintaining the strength of Portland cement after hardening. It can be removed from the hardened cement without resulting in a decrease in strength. The situation is quite the opposite in the case of water combined in the calcium hydroxide; if this is removed from the cement, an instantaneous drop in strength results.

Although the writers thus conclude that the removal of water from the hydrates of the aluminates and silicates is without influence on the strength of the hardened cements, they naturally do not mean that the resulting silica and alumina compounds are without any influence, but the water content and the nature of the water combination is inconsiderable for the strength of the Portland cement. The isolation and investigation of individual hydrates of compounds of lime with silica or alumina thus promise no further insight into the hardening process.—F. Krauss and C. Prüssing in *Zement* 23:486-491, 499-505, Aug. 23 and 30, 1934.

Defends Method of Test Used on Railroad Ballast

Various articles in the German technical press have attacked the adequacy or correctness of the method of test employed by the German State Railway for determining the fitness of stone for railway ballast, that method being a test for resistance to impact. In *Steinindustrie* for Aug. 9, 1934 (29:228-230), an official of the state railway (Stübel) defends the test method by comparing the results obtained by the impact test with those obtained in ramming tests (hand and machine) by Dr. Pirath. The comparison indicates that the impact test yields the same results in determining the comparative usefulness of various stones for use as railway ballast as do the investigations of Dr. Pirath, and that the value of ballast depends solely—given adequate resistance to weathering—on the stone's resistance to impact, and its compressive strength and hardness do not have to be determined in judging its usefulness for ballast.

As a service to its readers PIT AND QUARRY *is prepared to supply, at the actual cost of labor and materials, an English translation of any paper abstracted in this magazine. In the case of illustrated papers or articles photostatic reproductions of the illustrations will accompany the translations. Prices will be quoted on request.*

Plan Manufacture of Cement and Sulphuric

In the vicinity of Artemovsk in the U. S. S. R. it is being planned to erect a plant for the manufacture of cement and sulfuric acid from clay and gypsum or anhydrite. The proposed plant is described by Prof. P. P. Budnikoff in *Tonindustrie-Zeitung* for Aug. 16, 1934 (58:790-791). It is to produce 400,000 bbl. yearly of blast-furnace cement (50 per cent. Portland-cement clinker and 50 per cent. granulated basic blast-furnace slag) and about 33,100 tons of sulfuric acid, the latter produced by the Peterson tower process. The production of blast-furnace cement was chosen largely because the admixture of blast-furnace slag will make it possible to avoid certain dangers such as might result from too-high content of sulfide, etc., in the clinker. The cement will be burned in a kiln of Russian manufacture, 10 ft. in diameter and 170 ft. long.

Combination of Magnesia in a Quaternary System

In an X-ray study of the system $4CaO.Al_2O_3.Fe_2O_3$-MgO the authors found that no quaternary combination occurs, but the formation of mixed crystals up to a magnesia content of 2 per cent. by weight was determined. It was demonstrated that the dark green color of Brownmillerite in which MgO is contained is conditioned by the formation of mixed crystals, for it disappears when the MgO is combined by Al_2O_3 to spinel. In connection with a study of the limits of the formation of spinel in the quaternary system CaO-MgO-Al_2O_3-Fe_2O_3 it was shown that the formation of spinel even in iron-bearing Portland cement is not possible. — H. E. Schwiete and H. zur Strassen in *Zement* 23:511-514, Sept. 6, 1934.

Wellman Appoints New Los Angeles Distributor

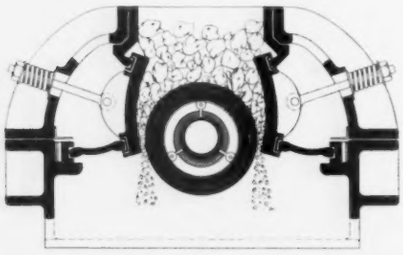
The Wellman Engineering Co., Cleveland, O., has appointed Harron Rickard & McCone as distributors for the Williams clamshell and dragline buckets for the Los Angeles territory. This company has been the distributors for this line in the San Francisco territory for some time and now maintain offices in both those cities.

It is announced that a reorganization of the General Automatic Lock Nut Corp. has been effected and that its business will hereafter be conducted under the name of Automatic Nut Co., Inc., Chrysler Bldg., New York City.

New Machinery and Supplies

Crushing Cylinder Reduces Material by Creeping Action

The Bonnot Co., Canton, O., announces the Bonnot reduction crusher which incorporates many distinctive features. The main feature is that the crusher cylinder or mantle does not revolve but has a slight creeping action which insures uniform distribution of wear around the entire circumference. Other features are: manganese wearing parts, reversible concaves, cast steel frames, bronze sleeve bearings, renewable liners, extra large alloy steel shaft, positive pressure lubrication, and cast iron safety or breaker plates.



Non-rotating reduction crusher.

The simplicity of this crusher is one of its outstanding characteristics. No gears, countershaft or eccentric sleeves are required in the driving or crushing action. Lubrication is by positive force feed with a separate feed and individual adjustment for each bearing. All wearing parts are manganese steel and accessible for renewal. The crusher is made in two sizes. The 4½-in by 24-in. unit has a rated capacity of 15 to 25 tons per hour at ½-in. setting and 45 to 55 tons per hour at 1½-in. setting. The 4½-in. by 36-in. crusher has capacities of 30 to 40 and 70 to 90 tons per hour at the same settings.

Two-Purpose Goggles Protect Owner from Impact and Light

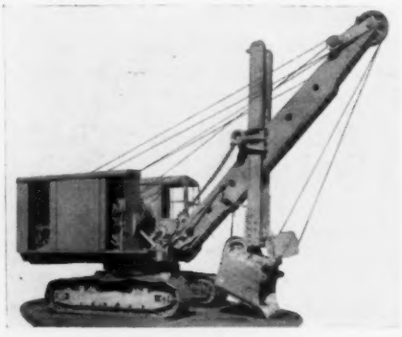
Willson Products, Inc., Reading, Pa., announces the new Style DC50 goggle designed for extremely dangerous jobs. This goggle is actually two goggles in one, providing protection against impact, flying particles, etc., and also against dangerous light rays. It is an anatomically-shaped composition cup goggle with 50 mm. clear Super-Tough lenses next the eye and 50 mm. Willson Weld lenses in a hinged frame. It is used open for chipping and closed for welding. Ample ventilation is supplied through indirect ports and the goggle is supplied with an adjustable leather nose bridge and an elastic head band.

Goggles for dangerous jobs.

Convertible Shovel, Crane, Dragline of 1½-Cu.Yd. Size

The Osgood Co., Marion, O., announces the new Osgood Victor Special 1½-cu.yd. convertible shovel, crane, dragline, back hoe and skimmer scoop. This unit is convertible from one class of service to another without the necessity of any machinery changes, only the front end equipment needing to be changed. Balance was one of the main objects in the design of this machine and this was obtained by keeping all of the operating machinery back of the center line of rotation.

Virtually all the machinery shafts are carried in anti-friction bearings, the shafting is all of vanadium steel alloy, and gears and pinions are of special-analysis steel. The upper revolving body and the lower body and roller path as well as the crawler side-frames are all one-piece, titanium treated annealed steel castings. Steering is under full control of the operator from his position at the levers. Full view is afforded by glass windows in steel frames and the construction of the steel cab which is cut back on the opposite side. This unit is available with gasoline or Diesel engine or single electric motor drive. Transmission from the power unit is through a heavy silent chain.

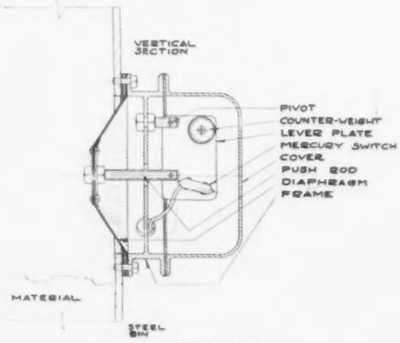


New 1½-cu.yd. shovel.

Small Electric Device Shows Height of Material in Bins

The Ripley Manufacturing Co., Wayne, Mich., after years of experimentation has developed a Bin-Dicator for indicating the level of material in bins. This unit is made in two types: AV for vertical mounting and AH for horizontal mounting. It is equipped with a single-pole mercury switch, either 5 or 15 amp., which can be mounted either normally-open or normally-closed. Mounting requires one 8-in. diameter hole in the bin wall. The switch can be operated at 550 volts and can be used to operate any standard control equipment for a.c. motors up to 550 v.

The operating mechanism consists of a dust-tight canvas diaphragm which actuates a counterweighted lever, which in turn operates a mercury switch. When the material in a bin, screw conveyor, or elevator boot exerts a pressure at the point where the Bin-Dicator is mounted, the diaphragm moves outward and operates the mercury switch. When the pressure is relieved the counterweight forces the diaphragm back to normal position, reversing the operation of the mercury switch. Features of this indicator are the adjustable counterweight for different materials, brass moving parts, and the use of a large diaphragm to make the unit sensitive and positive.

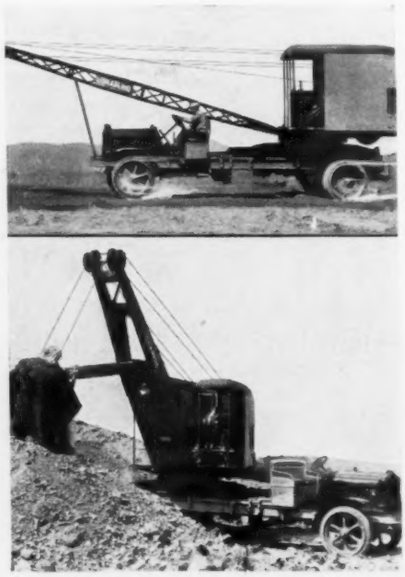


Material-level indicator.

New Truck-Mounted Shovels Full-Revolving One-Man Rigs

The Universal Crane Co., Lorain, O., has announced a new series of motor-truck mounted cranes and shovels. These are known as the Universal-Lorain 40, 37 and 30, and have crane lifting capacities of 8½, 7¾, 7½, 7, 6½ tons at 10 ft. radius. Crane booms are 25, 30 and 35 ft. in length and may be equipped with straight boom tip extensions 5, 10, 15 and 20 ft. long to afford a maximum 55 ft. boom. Gooseneck extensions of 5 and 10 ft. are also available. The shovel boom is a full shipper-shaft type, rope crowd, of the same design as used on crawler machines. Dippers are furnished in ¾, ½ and ⅜ cu.yd. sizes.

The machines are full revolving, one-man operated units powered by six-cylinder gasoline engines. They are built to the Thew center drive principle, in which it

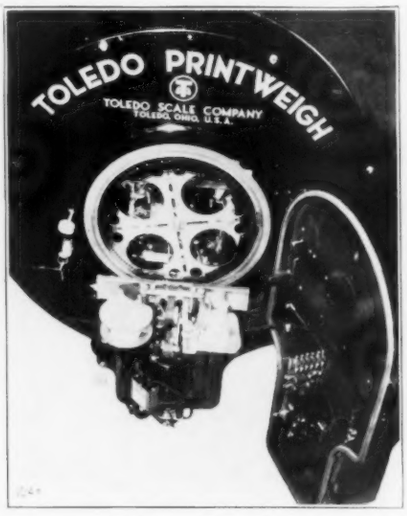


Truck-mounted excavators.

is claimed that the unit is so balanced as to keep weight to a minimum, thus enabling the unit to lift 6½ to 8½ tons, with a total turntable weight suitable for mounting on 5 to 7½ ton motor trucks of standard makes.

Automatic Dial-Scale Device Records and Prints Weights

The Toledo Scale Co., Toledo, O., announces the Printweigh, a new precision device said to record weights as accurately as they are weighed and eliminating human error. This device is electrically operated and can be used with any Toledo automatic dial scale, including those now



Printing weight recorder.

in use. It is made in any capacity from 50 to 50,000 lb. In place of the scale indicator there is a light-weight aluminum-alloy disc, weighing no more than the indicator itself. The weights are printed from a row of raised figures located on this disc. The ticket or paper strip on which the weight is to be recorded is placed between the disc and the squeeze platten, the inked ribbon coming between the ticket and the platten. The printing ribbon is automatically fed and rewound. By touching the operating button the back platten and the squeeze platten come together quickly and firmly and print the weight. As many as four copies of a record can be made simultaneously on ribbons, cards or other forms of records.

Positive-Traction Truck Has Short-Radius Turning Ability

The Euclid Road Machinery Co., Cleveland, O., announces the Euclid rear-dump Trac-Truk which is designed for heavy hauling under adverse conditions. Advantages claimed for this unit are: short turning radius, positive traction, and quick dumping. The truck has a live load capacity of 6 cu. yd. or 20,000 lb. and has a total net weight of 15,000 lb. without tire tracks.

The body is one-piece all-steel construction with oak planking inserted between bottom sections. The frame is of extra-heavy channels. The front axle is of the heavy-duty truck type equipped with roller bearing wheel mountings. The rear axle is a heavy-duty double reduction type with independent foot-operated steering brakes for each wheel and is equipped with ball bearings.

The engine is a 6-cyl. Model SRK Waukesha delivering 100 hp. at 1800 r.p.m. and having electric starter and battery standard equipment. Speeds when equipped with tracks range from 3.1 m.p.h. in first gear to 13.5 m.p.h. in fourth gear. Speed in reverse is 2.5 m.p.h. Dumping equipment consists of a hydraulic pump equipped with safety relief valve and a hoist which elevates the body to an 80 deg. dumping position in 15 sec. Single pneumatic front and rear tires are standard equipment. Dual rear tires or 21-in. tire tracks can also be supplied.

Trailer Dump Mechanism Discharges to Rear or Sides

The Highway Trailer Co., Edgerton, Wis., announces the Universal semi-trailer dump which is said to involve a new principle in motor dump vehicles. This unit uses the Highway mechanical hoist and dumps to rear or either side. It is said that this unit carries more payload with less dead weight. It is made in four models ranging in capacity from 2 to 5 ton to 5 to 10 ton. Equipment includes chrome nickel steel axles, vacuum or electric brakes, dual tires and a fifth wheel. Two-compartment bodies with chute in tail gate and controller for trailer brakes are standard.

Full-Revolving, Convertible Excavator of ⅜-Cu.Yd. Size

The new 10-B, ⅜-cu.yd. excavator announced by Bucyrus-Erie Co., South Milwaukee, Wis., is fully and quickly convertible, and is offered with all types of front end equipment as a shovel, dragline, crane, clamshell, drag shovel, skimmer scoop, back filler, or pile driver. Full-revolving, the 10-B offers practical working ranges that are said to compare favorably with larger machines. The shovel with standard boom at 45 deg. has a maximum cutting radius of 20 ft. 3 in., a clear dumping height of 12 ft. 6 in. The crane rating at 10 ft. radius is quoted at 7,000 lb. Dragline and clamshell easily handle a ⅜-cu.yd. bucket on a 28-ft. boom.

The machine weighs only 7½ to 8 tons depending on the equipment used. This light weight and the compactness of the machine have been secured by utilizing high quality, heat-treated, alloy steels with welded construcvtion and simplified design.

Speeds to 4¼ mi. per hr. are available and the machine is said to steer accurately through friction clutches as readily as a tractor, making long, short or right-angle turns. It also climbs grades even steeper than 30 per cent. This new machine has a tail swing of only 5 ft. 7 in. which makes it particularly suited for work in close quarters frequently encountered with a machine of this size. Among the many mechanical features are automatic lubrication; ball and roller bearings throughout; elimination of center pintle by the hooked-roller swing-circle; a new type of boom construction; new dipper; and power dipper trip.

Portable Air-Compressor Has Heavy-Duty Industrial Engine

The Sullivan Machinery Co., Chicago, Ill., announces its new Type WK60 portable air compressor. This compressor is a two-stage design of the angle or "V" type with the air end air cooled. This is

Portable air compressor.

said to reduce fuel consumption which is also decreased by a new Wafer valve of large port area and low lift. The base is welded structural steel and the main bearings are ball bearings.

The power plant is the regular line of heavy-duty industrial type engine used in previous models. Accessories include air cleaners, oil filters, etc. The Type WK60 portable air compressor is made in the four sizes for which the company has had the greatest demand and may be obtained in any kind of mounting.

The Macwhyte Co., Kenosha, Wis., has appointed the Zalk-Joseph Co. as its distributor in Duluth, Minn.

Motor truck of short turning radius.

Full-revolving convertible excavator.

Classified Buyers' Guide

A Directory of PIT AND QUARRY Advertisers Arranged According to Product

Although every effort is made to insure accuracy and completeness in these listings, the publisher cannot accept responsibility for errors or omissions. Any mistakes discovered will gladly be rectified, if brought to the attention of the Advertisers' Service Department.

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Aggregate-Bituminizing Plants
Hetherington & Berner, Inc.

Agitating Ladders (Dredge)
*Eagle Iron Works
Pettibone Mulliken Co.

Air Compressors (Portable)
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Air Compressors (Stationary)
*Ingersoll-Rand Co.

Air Pumps
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Air Separators
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Raymond Bros. Impact Pulv. Co.

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*Bartlett & Snow Co., C. O.
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*Kennedy-Van Saun Mfg. and Eng. Corp.

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*Robins Conveying Belt Co.
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*Robins Conveying Belt Co.
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*Hendrick Mfg. Co.
Hetherington & Berner, Inc.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
*Link-Belt Co.
McLanahan and Stone Corp.
Sprout, Waldron & Co.

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*Hercules Powder Co.

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*Ensign-Bickford Co.
*Hercules Powder Co.

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*Bartlett & Snow Co., C. O.

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Pennsylvania Drilling Co.

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Buffalo Wire Works Co.
National Wire Cloth Co.

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*Bartlett & Snow Co., C. O.
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*Link-Belt Co.
Pettibone Mulliken Co.
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*Bartlett & Snow Co., C. O.
*Link-Belt Co.
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*Hendrick Mfg. Co.
*Jeffrey Mfg. Co.
*Link-Belt Co.
McLanahan and Stone Corp.
Pettibone Mulliken Co.
*Robins Conveying Belt Co.
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Sprout, Waldron & Co.

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Sprout, Waldron & Co.

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*Hercules Powder Co.

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*Kennedy-Van Saun Mfg. and Eng. Corp.
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Pettibone Mulliken Co.
*Robins Conveying Belt Co.
Sprout, Waldron & Co.

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Sprout, Waldron & Co.

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*Jeffrey Mfg. Co.
*Link-Belt Co.
Sprout, Waldron & Co.

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Goodyear Tire & Rubber Co.
Haiss Mfg. Co., Geo.
*Hendrick Mfg. Co.
*Jeffrey Mfg. Co.
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Morrow Mfg. Co.
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Lewistown Foundry & Machine Co.
*Link-Belt Co.

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*American Steel & Wire Co.

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*Link-Belt Co.
Sprout, Waldron & Co.

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*Allis-Chalmers Mfg. Co.
*Bartlett & Snow Co., C. O.
Bonnot Co.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Raymond Bros. Impact Pulv. Co.

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*Ingersoll-Rand Co.

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*Bartlett & Snow Co., C. O.
*Link-Belt Co.
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*Jeffrey Mfg. Co.
*Link-Belt Co.
*Robins Conveying Belt Co.
Sprout, Waldron & Co.

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Allen-Sherman-Hoff Co.
*Allis-Chalmers Mfg. Co.
*Bartlett & Snow Co., C. O.
*Gruendler Crusher & Pulv. Co.
Haiss Mfg. Co., Geo.
*Hendrick Mfg. Co.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Foundry & Machinery Co.
*Link-Belt Co.
McLanahan and Stone Corp.
Morrow Mfg. Co.
*Robins Conveying Belt Co.
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Sprout, Waldron & Co.
*Universal Crusher Co.

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*Jeffrey Mfg. Co.
*Link-Belt Co.
*Robins Conveying Belt Co.

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Couplings (Flexible and Shaft)
*Ingersoll-Rand Co.
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*Link-Belt Co.
*Robins Conveying Belt Co.
Sprout, Waldron & Co.

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*Austin-Western Road Machy. Co.
*Link-Belt Co.
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*American Pulverizer Co.
*Bartlett & Snow Co., C. O.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Krupp Grusonwerk, Fried.
McLanahan and Stone Corp.
Pettibone Mulliken Co.

Crushers (Hammer)
*Allis-Chalmers Mfg. Co.
*American Pulverizer Co.
*Austin-Western Road Machy. Co.
*Bartlett & Snow Co., C. O.
Bonnot Co.
*Dixie Machy. Mfg. Co.
*Gruendler Crusher & Pulv. Co.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
*Universal Crusher Co.

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*Allis-Chalmers Mfg. Co.
*Austin-Western Road Machy. Co.
*Bartlett & Snow Co., C. O.
*Gruendler Crusher & Pulv. Co.
*Jeffrey Mfg. Co.
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Smith Engr. Works
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*American Pulverizer Co.
*Bartlett & Snow Co., C. O.

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*Allis-Chalmers Mfg. Co.
*American Pulverizer Co.
*Austin-Western Road Machy. Co.
*Bartlett & Snow Co., C. O.
Bonnot Co.
*Gruendler Crusher & Pulv. Co.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
*Link-Belt Co.
McLanahan and Stone Corp.
*Robins Conveying Belt Co.

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*Allis-Chalmers Mfg. Co.
*American Pulverizer Co.
*Austin-Western Road Machy. Co.
*Bartlett & Snow Co., C. O.
Bonnot Co.

Crushing Rolls
*Allis-Chalmers Mfg. Co.
*Bartlett & Snow Co., C. O.
Bonnot Co.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
*Link-Belt Co.
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*Hercules Powder Co.

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*Link-Belt Co.

Dragline Excavators
*Austin-Western Road Machy. Co.
*Link-Belt Co.
Ohio Power Shovel Co.

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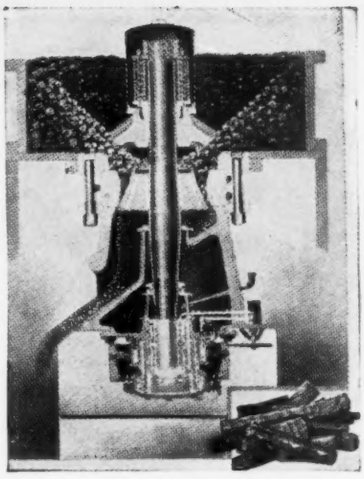
*Morris Machine Works

Drilling Contractors
Mott Core Drilling Co.
Pennsylvania Drilling Co.

Drills (Core)
*Ingersoll-Rand Co.
Mott Core Drilling Co.
Pennsylvania Drilling Co.

*** See also information in the 1934 Pit and Quarry HANDBOOK.**



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The Kennedy Ball Bearing Gearless Gyratory Crusher is guaranteed to produce a greater tonnage than any other crusher of a given size, with half the power per ton of ore. This crusher can be equipped with a synchronous motor in its pulley, or driven by belt from a standard motor.

The Savings Effected with this crusher are astounding:

In cost of Maintenance.....80%

In Power.....The entire cost of crusher and motor in pulley is amortized annually.

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Minus ⅜ in.	100%
Plus 3 mesh	21½%
Minus 3—Plus 4	17%
Minus 4—Plus 14	36½%
Minus 14—Plus 48	15%
Minus 48—Plus 100	4%
Minus 100	5½%

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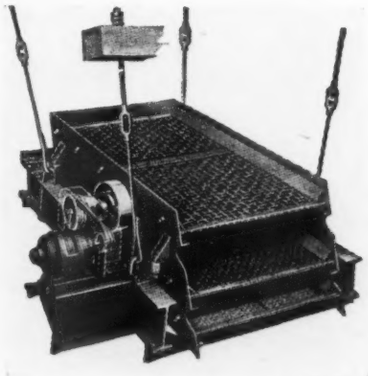

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Scores of plants are reducing replacement costs by the use of SELFVULC to stop the ravages of abrasion and corrosion. Here is what one user writes:

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Please send me your Bulletin on SELFVULC, and also full details of your TRIAL ORDER KIT containing supply of Plastic Rubber Compound and Primer with tools and instructions for applying.

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Classified Buyers' Guide

A Directory of PIT AND QUARRY Advertisers Arranged According to Product

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*Jeffrey Mfg. Co.

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Hetherington & Berner, Inc.

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Hoists
*Bartlett & Snow Co., C. O.
Hetherington & Berner, Inc.
*Ingersoll-Rand Co.
*Jeffrey Mfg. Co.
*Link-Belt Co.
McLanahan and Stone Corp.
Smith Engr. Works
Sprout, Waldron & Co.

Hoppers
*Hendrick Mfg. Co.
*Link-Belt Co.

Hose (Air, Steam and Water)
*Ingersoll-Rand Co.
Goodyear Tire & Rubber Co.
Self-Vulcanizing Rubber Co.

Hose Couplings (See Couplings)

Hydraulic Guns (See Guns—Hydraulic)

Idlers
*Bartlett & Snow Co., C. O.
*Jeffrey Mfg. Co.
*Link-Belt Co.
*Robins Conveying Belt Co.
Smith Engr. Works
Sprout, Waldron & Co.

Kilns and Coolers (Rotary)
*Allis-Chalmers Mfg. Co.
*Bartlett & Snow Co., C. O.
Bonnot Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Krupp Grusonwerk, Fried.

Lime-Handling Equipment
*Bartlett & Snow Co., C. O.
*Jeffrey Mfg. Co.
*Link-Belt Co.
Raymond Bros. Impact Pulv. Co.
*Robins Conveying Belt Co.

Lime Kilns
*Bartlett & Snow Co., C. O.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Krupp Grusonwerk, Fried.

Linings (Ball- and Tube-Mill) (See Mill Liners and Linings)

Liquid Rubber
Self-Vulcanizing Rubber Co.

Loaders and Unloaders
*Bartlett & Snow Co., C. O.
Haiss Mfg. Co., Geo.
*Jeffrey Mfg. Co.
*Link-Belt Co.
*Robins Conveying Belt Co.
Sprout, Waldron & Co.

Locomotives (Diesel)
*Fate-Root-Heath Co.
*Plymouth Locomotive Works.

Locomotives (Diesel-Electric)
*Fate-Root-Heath Co.
*Plymouth Locomotive Works.

Locomotives (Electric, Gas and Steam)
*Fate-Root-Heath Co.
*Lima Locomotive Works
*Plymouth Locomotive Works.

Locomotives (Gas-Electric)
*Fate-Root-Heath Co.
*Plymouth Locomotive Works.

Locomotives (Oil-Electric)
*Fate-Root-Heath Co.
*Plymouth Locomotive Works.

Locomotives (Trolley-Battery)
*Jeffrey Mfg. Co.

Magnetic Pulleys (See Pulleys, Magnetic)

Manganese Steel
Pettibone Mulliken Co.

Manganese Steel (Plates and Sheets)
Pettibone Mulliken Co.

Mill Liners and Linings
*Bartlett & Snow Co., C. O.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.

Mills (Grinding) (See also Crushers—Hammer)
*Allis-Chalmers Mfg. Co.
*American Pulverizer Co.
*Bartlett & Snow Co., C. O.
Bonnot Co.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Fdy. & Mch. Co.
Raymond Bros. Impact Pulv. Co.
Sprout, Waldron & Co.

Motor Trucks
General Motors Truck Co.

Motors and Generators
*Allis-Chalmers Mfg. Co.

Motors (Internal-Combustion) (See Engines — Internal-Combustion)

Nails
*American Steel & Wire Co.

Netting (Locomotive Stack)
Buffalo Wire Works Co.

Nozzles (Hydraulic) (See Guns—Hydraulic)

Packings
Goodyear Tire and Rubber Co.
Self-Vulcanizing Rubber Co.

Partitions (Wire)
Buffalo Wire Works Co.
National Wire Cloth Co.

Perforated Metal Plates
*Allis-Chalmers Mfg. Co.
*Bartlett & Snow Co., C. O.
Chicago Perforating Co.
*Hendrick Mfg. Co.
Morrow Mfg. Co.
Sprout, Waldron & Co.

Pipe Flanges
Hetherington & Berner, Inc.

Plastic Rubber
Self-Vulcanizing Rubber Co.

Plug Valves (See Valves)

Pneumatic Drills (See Drills, Rock)

Portable Conveyors
Haiss Mfg. Co., Geo.
*Jeffrey Mfg. Co.
*Link-Belt Co.
*Robins Conveying Belt Co.
Sprout, Waldron & Co.

Portable Crushing and Screening Plants
*Austin-Western Road Machy. Co.
*Bartlett & Snow Co., C. O.
*Gruendler Crusher & Pulv. Co.
*Jeffrey Mfg. Co.
*Universal Crusher Co.

Portable Engines (See Engines—Internal Combustion)

Portable Loaders (See Loaders and Unloaders)

Power Cables (Rubber Clad)
*American Steel & Wire Co.

Power Shovels (See Shovels, Electric, Internal-Combustion and Steam)

Pulleys (Magnetic)
Sprout, Waldron & Co.

Pulleys (Wing)
Sprout, Waldron & Co.

Pulverized Fuel Systems
*Bartlett & Snow Co., C. O.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Raymond Bros. Impact Pulv. Co.

Pulverizers (See also Crushers; Mills; etc.)
*American Pulverizer Co.
*Austin-Western Road Machy. Co.
*Bartlett & Snow Co., C. O.
Bonnot Co.
*Gruendler Crusher & Pulv. Co.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Krupp Grusonwerk, Fried.
Lewistown Foundry & Machinery Co.
Raymond Bros. Impact Pulv. Co.
*Universal Crusher Co.

Pump Valves (See Valves Pump)

Pumps (Air Lift)
*Ingersoll-Rand Co.

Pumps (Cement Slurry)
Allen-Sherman-Hoff Co.
*Morris Machine Works

Pumps (Centrifugal)
Allen-Sherman-Hoff Co.
*Allis-Chalmers Mfg. Co.
Erie Pump & Engine Works
Hetherington & Berner, Inc.
*Ingersoll-Rand Co.
*Morris Machine Works
Pettibone Mulliken Co.

Pumps (Dredging)
Allen-Sherman-Hoff Co.
*Allis-Chalmers Mfg. Co.
Erie Pump & Engine Works
Hetherington & Berner, Inc.
*Morris Machine Works
Pettibone Mulliken Co.

Pumps (Sand and Gravel)
Allen-Sherman-Hoff Co.
*Allis-Chalmers Mfg. Co.
Erie Pump & Engine Works
Hetherington & Berner, Inc.
*Ingersoll-Rand Co.
*Morris Machine Works
Pettibone Mulliken Co.

Ready-Mixed Concrete Plants
*Bartlett & Snow Co., C. O.

Respirators
Pulmosan Safety Equipment Corp.

*** See also information in the 1934 Pit and Quarry HANDBOOK.**

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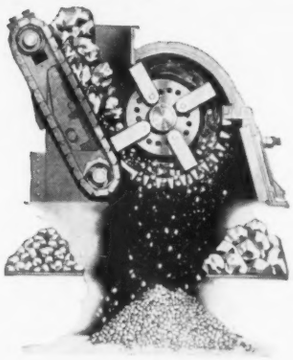
the Symbol of Crushing Power



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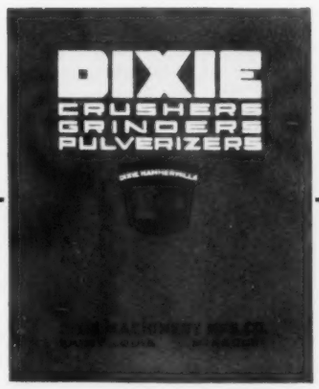

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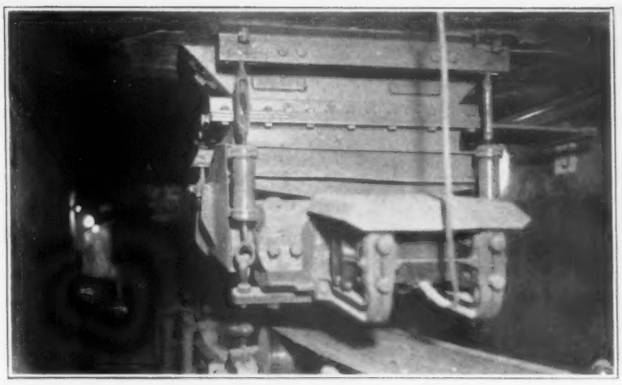

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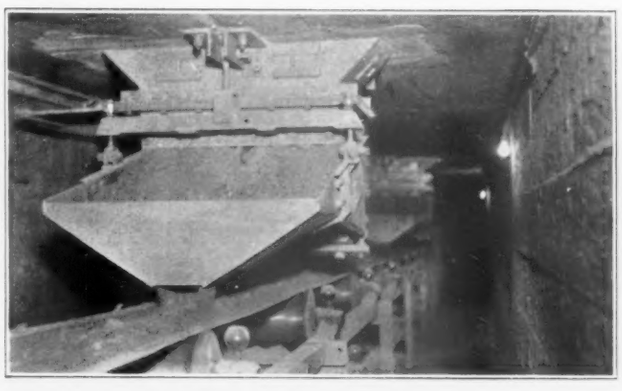

Classified Buyers' Guide

A Directory of PIT AND QUARRY Advertisers Arranged According to Product

Index to Advertisers on Page 68

Rock Drills (See Drills—Rock)

Rod Mills
*Kennedy-Van Saun Mfg. and Eng. Corp.

Rope (Wire) (See Wire Rope)

Safety Equipment
Pulmosan Safety Equipment Corp.

Rust Protection
Self-Vulcanizing Rubber Co.

Sand Separators
*Bartlett & Snow Co., C. O.
*Jeffrey Mfg. Co.
*Link-Belt Co.
McLanahan and Stone Corp.
Smith Engr. Works

Sand-Settling Tanks
*Bartlett & Snow Co., C. O.
*Jeffrey Mfg. Co.
*Link-Belt Co.
Smith Engr. Works

Scales
*Merrick Scale Mfg. Co.

Scrapers (Power Drag)
*Austin-Western Road Machy. Co.
*Link-Belt Co.

Screens
*Allis-Chalmers Mfg. Co.
Audubon Wire Cloth Corp.
*Bartlett & Snow Co., C. O.
Buffalo Wire Works Co.
Chicago Perforating Co.
Deister Machine Co.
*Eagle Iron Works
*Gruendler Crusher & Pulv. Co.
Haiss Mfg. Co., Geo.
*Hendrick Mfg. Co.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Foundry & Machinery Co.
*Link-Belt Co.
McLanahan and Stone Corp.
Morrow Mfg. Co.
National Wire Cloth Co.
Orville Simpson Co.
Productive Equip. Corp.
*Robins Conveying Belt Co.
Smith Engr. Works
Sprout, Waldron & Co.
*Universal Crusher Co.

Screens (Vibrating or Shaking)
*Allis-Chalmers Mfg. Co.
*Austin-Western Road Machy. Co.
*Bartlett & Snow Co., C. O.
Buffalo Wire Works Co.
Deister Machine Co.
*Gruendler Crusher & Pulv. Co.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Foundry & Machinery Co.
*Link-Belt Co.
McLanahan and Stone Corp.
Orville Simpson Co.
Productive Equip. Corp.
*Robins Conveying Belt Co.
Smith Engr. Works
Sprout, Waldron & Co.
*Universal Crusher Co.

Separators (Air) (See Air Separators)

Sheaves
*Allis-Chalmers Mfg. Co.
*Eagle Iron Works
*Gruendler Crusher & Pulv. Co.
Haiss Mfg. Co., Geo.
Hetherington & Berner, Inc.
*Jeffrey Mfg. Co.
*Link-Belt Co.
McLanahan and Stone Corp.
Pettibone Mulliken Co.
Sprout, Waldron & Co.

Shovels (Electric, Internal Combustion and Steam)
*Austin-Western Road Machy. Co.
*Link-Belt Co.
Ohio Power Shovel Co.

Skip Hoists and Skips
*Allis-Chalmers Mfg. Co.
*Bartlett & Snow Co., C. O.
Hetherington & Berner, Inc.
*Jeffrey Mfg. Co.
*Link-Belt Co.
*Robins Conveying Belt Co.

Speed Reduction Units
*Link-Belt Co.

Spouts (See Chutes and Chute Liners)

Sprockets and Chain
*Bartlett & Snow Co., C. O.
*Jeffrey Mfg. Co.
*Link-Belt Co.
Pettibone Mulliken Co.
Sprout, Waldron & Co.

Stackers
*Jeffrey Mfg. Co.

Steel Grating (See Grating, Steel)

Steel Inclines (See Inclines, Steel)

Steel Plate Construction
*Hendrick Mfg. Co.
Hetherington & Berner, Inc.
Sprout, Waldron & Co.

Storage Equipment
*Bartlett & Snow Co., C. O.
Haiss Mfg. Co., Geo.
*Jeffrey Mfg. Co.
*Link-Belt Co.
Neff & Fry Co.

Sweeping Systems
Allen-Sherman-Hoff Co.

Tanks
*Bartlett & Snow Co., C. O.
*Hendrick Mfg. Co.
*Link-Belt Co.

Tanks (Sand-Settling)
*Bartlett & Snow Co., C. O.
*Jeffrey Mfg. Co.
*Link-Belt Co.
Morrow Mfg. Co.
Smith Engr. Works

Tires (Truck)
Goodyear Tire & Rubber Co.

Tools (Drill) (See Drilling Accessories)

Truck Equipment
Pettibone Mulliken Co.

Tractors
*Allis-Chalmers Mfg. Co.
*Fate-Root-Heath Co.
*Plymouth Locomotive Works.

Trailers
General Motors Truck Co.

Tramways (Aerial)
*American Steel & Wire Co.

Transformers
*Allis-Chalmers Mfg. Co.

Transmission Belting (See Belting)

Transmission Machinery
*Allis-Chalmers Mfg. Co.
*Bartlett & Snow Co., C. O.
*Gruendler Crusher & Pulv. Co.
*Jeffrey Mfg. Co.
*Link-Belt Co.

Trippers
*Bartlett & Snow Co., C. O.
*Jeffrey Mfg. Co.
*Link-Belt Co.
*Robins Conveying Belt Co.

Truck Cranes (See Cranes)

Truck Mixers
*Bartlett & Snow Co., C. O.

Trucks and Trailers (See Motor Trucks)

Tube-Mills (See Mills—Ball, Tube, etc.)

Underground Loaders
*Allis-Chalmers Mfg. Co.
*Bartlett & Snow Co., C. O.

Unloaders (Box Car)
Barber-Greene Co.
*Bartlett & Snow Co., C. O.
*Jeffrey Mfg. Co.
*Link-Belt Co.

Variable Speed Reducers or Transmissions
*Link-Belt Co.

Vibrating Screen Plate
*Bartlett & Snow Co., C. O.
Chicago Perforating Co.
*Hendrick Mfg. Co.
*Jeffrey Mfg. Co.
*Link-Belt Co.
Morrow Mfg. Co.

Vibrating Screens (See Screens—Vibrating)

Washers (Sand, Gravel and Stone)
*Allis-Chalmers Mfg. Co.
*Bartlett & Snow Co., C. O.
*Eagle Iron Works
Haiss Mfg. Co., Geo.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Foundry & Machinery Co.
*Link-Belt Co.
McLanahan and Stone Corp.
Smith Engr. Works

Weighing Equipment (Automatic)
*Merrick Scale Mfg. Co.

Welding Supplies
*American Steel & Wire Co.

Well Drills (See Drills—Well)

Wheels (Car)
*Eagle Iron Works
Iowa Mfg. Co.
Pettibone Mulliken Co.

Winches and Capstans
*Bartlett & Snow Co., C. O.
*Jeffrey Mfg. Co.
*Link-Belt Co.
*Robins Conveying Belt Co.
Sprout, Waldron & Co.

Wire & Cable (Electric)
*American Steel & Wire Co.

Wire Cloth
Audubon Wire Cloth Corp.
Buffalo Wire Works Co.
National Wire Cloth Co.
*Robins Conveying Belt Co.

Wire Rope
*American Steel & Wire Co.
Buffalo Wire Works Co.
Williamsport Wire Rope Co.

Wire-Rope Fittings
*American Steel & Wire Co.
Buffalo Wire Works Co.
Williamsport Wire Rope Co.

Wire Rope Slings
*American Steel & Wire Co.
Williamsport Wire Rope Co.

Wire (Welding)
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Worm Gears (See Gears and Pinions)

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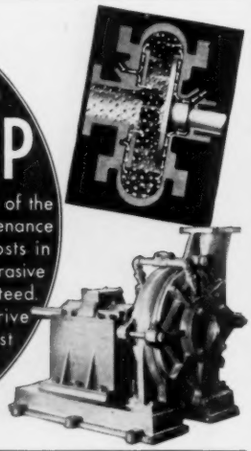

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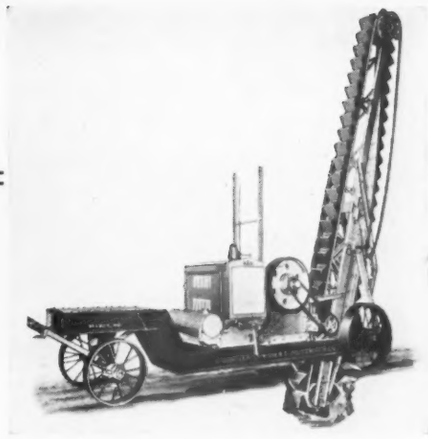

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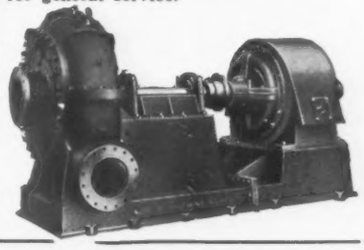

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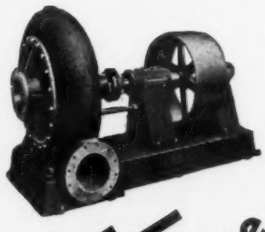

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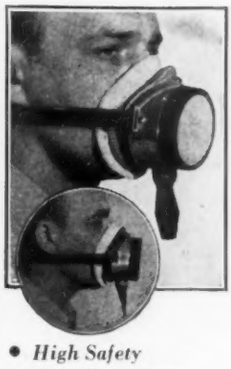

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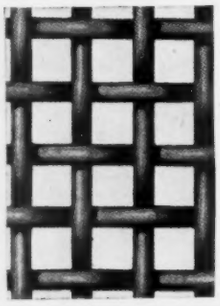

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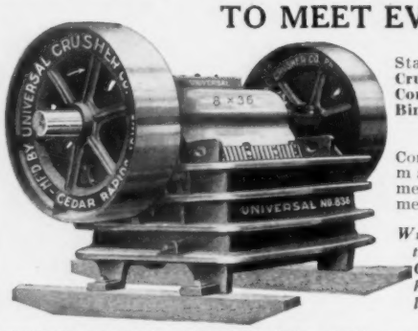

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- ☐Belt dressing
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- ☐Cranes, Overhead Traveling
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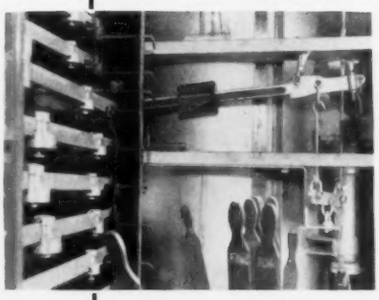
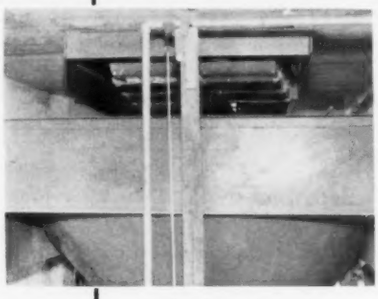


Cement and aggregate scale beams at left. Water weighing tank and scale in background.



Weighing batcher BELOW *and* ABOVE *gates for aggregate storage bin.*

This complete installation for Hilltop Builders Supply Company of Cincinnati typifies a modern concrete mixing plant at its best—an example of how *planned economy* makes increased profits possible even in a highly competitive field.

It is the newest plant in the Cincinnati district, going into operation in April of this year. Its location is based on practical considerations as to sources of raw materials and convenience of transportation. All units of equipment are selected to operate in perfect coordination for the most economical handling of the material throughout the process. The 1½ yd. mixer governs the capacity, being teamed up with a 7½-ton aggregate batcher. The beam scale for batching equipment has 10 beams, three for cement and 7 for aggregate. Bins, hoppers and elevators, are gauged to the capacity requirements of the plant, insuring an efficient flow of material.

If you are interested in modernizing your plant or re-equipping it for lower cost operation, you can use Neff & Fry engineering service to advantage. Your inquiries are invited. No obligation.

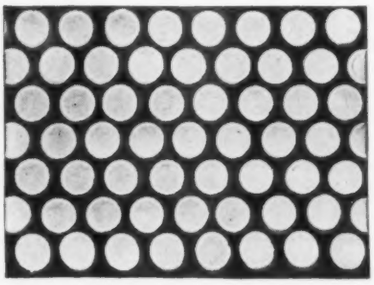
Latest type of concrete mixing plant built for Hilltop Builders Supply Co. at Cincinnati, Ohio. Neff and Fry, Engineers.

Specializing in plants for the production and distribution of sand, gravel and ready mixed concrete

NEFF & FRY COMPANY

CAMDEN OHIO Manufacturers and Builders

MORROW SCREEN PLATES



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ARE CUTTING COSTS

FOR THEIR OWNERS TODAY

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SENSATIONAL pump performance is achieved by the new "Wear Resister"—a Pettibone Mulliken development that stops destructive abrasion by protecting pump shell, side plates and liners at vital points. It prolongs pump life, reduces repair costs, eliminates costly shutdowns and steps up production. It contributes to the high record of Diamond Dredge Pumps for *wearability* under severe conditions.

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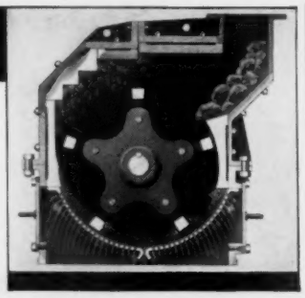
PETTIBONE MULLIKEN CO.

4712 Division Street, Chicago, Ill.

Crushers



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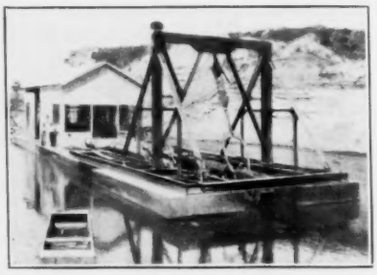

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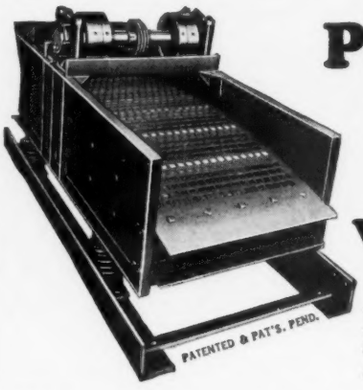

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3-675	Al. Ch. syn.	900
400	West. sl. rg.	514
400	Al. Ch. syn.	300
300	Al. Ch. sl. rg.	585
260	Al. Ch. syn.	720
250	West. sl. rg.	720
200	G. E. sl. rg.	1200
200	West. sl. rg.	500
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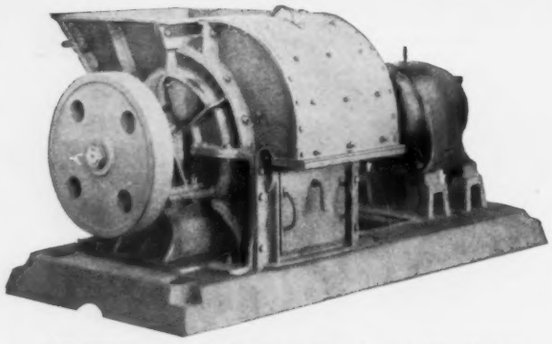

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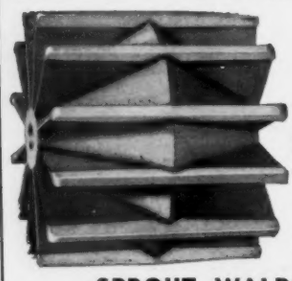

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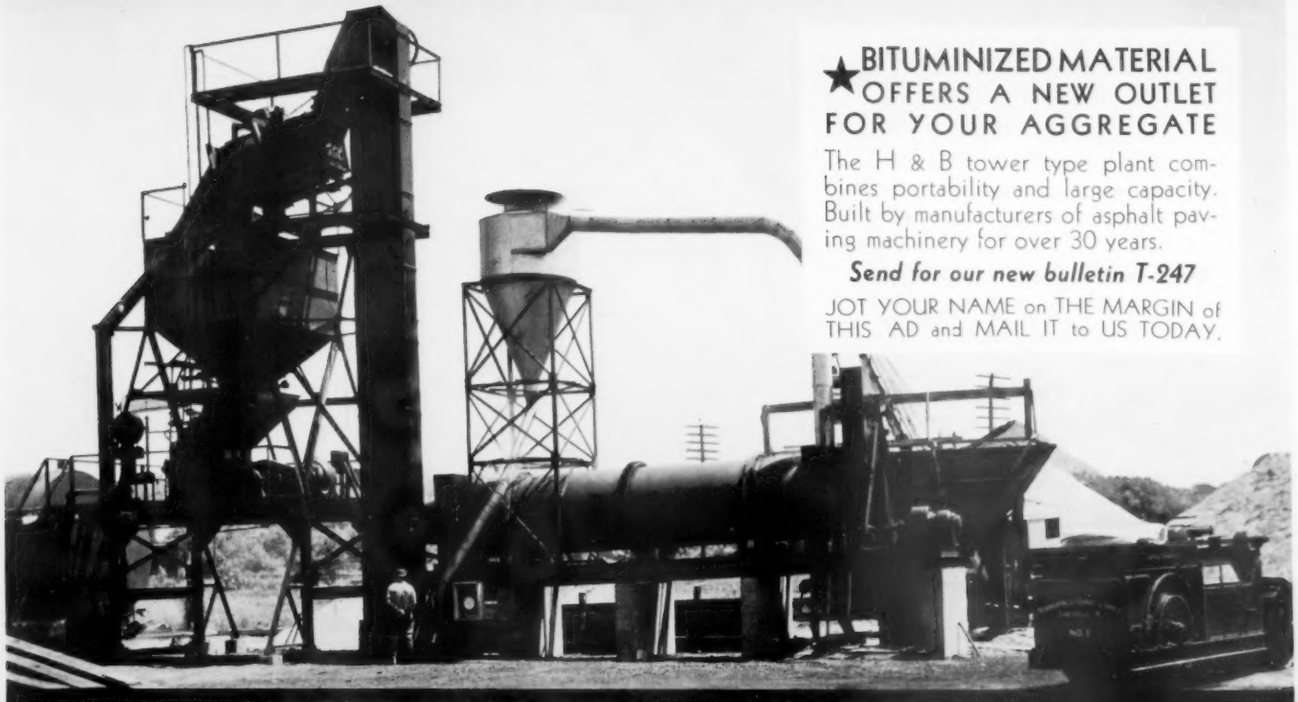

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